ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM

PERMIT FACT SHEET – DRAFT

Permit Number: AK0053686

Kitchen Lights Unit Gas Production Platform A

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501

Public Comment Period Start Date: February 26, 2014
Public Comment Period Expiration Date: March 28, 2014
Alaska Online Public Notice System

Technical Contact: Natalie Wagner
Alaska Department of Environmental Conservation
Division of Water
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501
(907) 269-7956
Fax: (907) 269-3487
Natalie.Wagner@alaska.gov

Proposed issuance of an Alaska Pollutant Discharge Elimination System (APDES) permit to

FURIE OPERATING ALASKA, LLC

For wastewater discharges from

Kitchen Lights Unit Gas Production Platform A
Cook Inlet Oil and Gas Lease Area (15 miles Northwest of Nikiski Bay)
1029 West 3rd Avenue, Suite 500
Anchorage, AK 99501

The Alaska Department of Environmental Conservation (the Department or DEC) proposes to issue an APDES individual permit (permit) to Furie Operating Alaska, LLC. The permit authorizes and sets conditions on the discharge of pollutants from this facility to waters of the U.S. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged from the facility and outlines best management practices to which the facility must adhere.

This fact sheet explains the nature of potential discharges from the construction and operation of KLU Gas Production Platform A and the development of the permit including:

- Information on public comment, public hearing, and appeal procedures
- A listing of proposed effluent limitations and other conditions
- Technical material supporting the conditions in the permit
- Proposed monitoring requirements in the permit

Public Comment

Persons wishing to comment on, or request a public hearing for the draft permit for this facility, may do so in writing by the expiration date of the public comment period.

Commenters are requested to submit a concise statement on the permit condition(s) and the relevant facts upon which the comments are based. Commenters are encouraged to cite specific permit requirements or conditions in their submittals.

A request for a public hearing must state the nature of the issues to be raised, as well as the requester's name, address, and telephone number. The Department will hold a public hearing whenever the Department finds, on the basis of requests, a significant degree of public interest in a draft permit. The Department may also hold a public hearing if a hearing might clarify one or more issues involved in a permit decision or for other good reason, in the Department's discretion. A public hearing will be held at the closest practicable location to the site of the operation. If the Department holds a public hearing, the Director will appoint a designee to preside at the hearing. The public may also submit written testimony in lieu of or in addition to providing oral testimony at the hearing. A hearing will be tape recorded. If there is sufficient public interest in a hearing, the comment period will be extended to allow time to public notice the hearing. Details about the time and location of the hearing will be provided in a separate notice.

All comments and requests for public hearings must be in writing and should be submitted to the Department at the technical contact address, fax, or email identified above (see also the public comments section of the attached public notice). Mailed comments and requests must be postmarked on or before the expiration date of the public comment period.

After the close of the public comment period and after a public hearing, if applicable, the Department will review the comments received on the draft permit. The Department will respond to the comments received in a Response to Comments document that will be made available to the public. If no substantive comments are received, the tentative conditions in the draft permit will become the proposed final permit.

The proposed final permit will be made publicly available for a five-day applicant review. The applicant may waive this review period. After the close of the proposed final permit review period, the Department will make a final decision regarding permit issuance. A final permit will become effective 30 days after the Department's decision, in accordance with the state's appeals process at 18 AAC 15.185.

The Department will transmit the final permit, fact sheet (amended as appropriate), and the Response to Comments to anyone who provided comments during the public comment period or who requested to be notified of the Department's final decision.

The Department has both an informal review process and a formal administrative appeal process for final APDES permit decisions. An informal review request must be delivered within 15 days after receiving the Department's decision to the Director of the Division of Water at the following address:

Director, Division of Water
Alaska Department of Environmental Conservation
555 Cordova Street
Anchorage, AK 99501

Interested persons can review 18 AAC 15.185 for the procedures and substantive requirements regarding a request for an informal Department review.

See http://www.dec.state.ak.us/commish/InformalReviews.htm for information regarding informal reviews of Department decisions.

An adjudicatory hearing request must be delivered to the Commissioner of the Department within 30 days of the permit decision or a decision issued under the informal review process. An adjudicatory hearing will be conducted by an administrative law judge in the Office of Administrative Hearings within the Department of Administration. A written request for an adjudicatory hearing shall be delivered to the Commissioner at the following address:

Commissioner
Alaska Department of Environmental Conservation at
410 Willoughby Street, Suite 303
Juneau AK, 99811-1800.

Interested persons can review 18 AAC 15.200 for the procedures and substantive requirements regarding a request for an adjudicatory hearing. See http://www.dec.state.ak.us/commish/ReviewGuidance.htm for information regarding appeals of Department decisions.

Documents are Available

The permit, fact sheet, application, and related documents can be obtained by visiting or contacting DEC between 8:00 a.m. and 4:30 p.m. Monday through Friday at the addresses below. The permit, fact sheet, application, and other information are located on the Department's Wastewater Discharge Authorization Program website: http://www.dec.state.ak.us/water/wwdp/index.htm.

Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 555 Cordova Street Anchorage, AK 99501 (907) 269-6285	Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 43335 Kalifornsky Beach Rd. - Suite 11 Soldotna, AK 99669 (907) 262-5210

This page is intentionally blank.

TABLE OF CONTENTS

TABLES

LIST OF APPENDICES

1.0 APPLICANT

This fact sheet provides information on the Alaska Pollutant Discharge Elimination System (APDES) permit for the following entity:

Name of Facility:	Kitchen Lights Unit Gas Production Platform A
APDES Permit Number:	AK0053686
Facility Location:	Latitude 60° 56’ 12.2”, Longitude -151° 9’ 22.7”
Mailing Address:	1029 West 3rd Avenue, Anchorage, AK 99501
Facility Contact:	Mr. Bruce Webb

The map in Appendix A to the Fact Sheet shows the location of the production platform and the discharge locations.

1.1 Authority

On October 31, 2008, the Environmental Protection Agency (EPA) approved the State’s application to administer the National Pollutant Discharge Elimination System (NPDES) Program for waters of the U.S. located in the State of Alaska. Transfer of the Program to the State occurred in four phases with oil and gas facilities transferring as part of Phase IV, which occurred on October 31, 2012. Accordingly, the Alaska Department of Environmental Conservation (DEC or the Department) is the APDES permitting authority for regulating the discharges associated with the Project.

Section 301(a) of the Clean Water Act (CWA) and Alaska Administrative Code (AAC) 18 AAC 83.015 provide that the discharge of pollutants to waters of the U.S. is unlawful except in accordance with an APDES permit. The proposed individual permit issuance is being developed in accordance with regulations 18 AAC 83.115 and 18 AAC 83.120. A violation of a condition contained in the permit constitutes a violation of the CWA and subjects the permittee of the facility with the permitted discharge to the penalties specified in Alaska Statute (AS) 46.03.020(13).

The Kitchen Lights Unit (KLU) Gas Production Platform A is a new proposed gas production facility, owned and operated by Furie Operating Alaska, LLC (Furie). On January 24, 2013 Furie submitted an APDES application for a new gas development project located in state waters in Cook Inlet, Alaska. The new production facility is classified as a new source per Code of Federal Regulations, Title 40, Part 435 (40 CFR 435), Oil and Gas Extraction Point Source Category, Subpart D – Coastal Subcategory, which means New Source Performance Standards (NSPS) apply to the facility’s discharge.

2.0 FACILITY INFORMATION

The information contained in the permit and this fact sheet is based on information in an APDES application submitted by Furie and follow up information requested by DEC for clarification. The KLU Gas Production Platform A will be a natural gas production platform located approximately 15 miles northwest of Nikiski Bay in the coastal zone of Cook Inlet, Alaska in water approximately 35 meters deep. Domestic wastewater and deck drainage discharges (Outfalls 001A and 002A, respectively) from the platform are anticipated to begin in August 2014. A mobile offshore drilling unit (MODU) will be used seasonally to conduct development or exploratory drilling. The discharge of domestic wastewater (Outfall 001B) from the seasonal MODU is covered under the permit while it is attached to the platform. The discharge from Outfall 001B will be combined with Outfall 001A so there will be a single discharge port and a common mixing zone based on the combined maximum discharges. The compliance points for outfalls 001A and 001B will be prior to the discharges being combined. A map and a process flow diagram are included in Appendix A depicting the general vicinity of the KLU Gas Production Platform A discharge location(s) associated with the permit, and production operations.

Furie has not determined which MODU will be contracted to perform development or exploratory drilling under the permit. The permit requires that any MODU used will have adequate domestic wastewater treatment to meet the permit limits. Accordingly, the subject permit requires that the MODU selected for seasonal development drilling must meet minimum treatment requirements associated with domestic waster per 18 AAC 72.050. In addition, prior to discharging domestic wastewater, engineering plans for domestic wastewater treatment systems must be submitted and approved by the Department per 18 AAC 72.200. Note, 18 AAC 72.600 also requires that plans be submitted for approval for the construction or modification of any non-domestic wastewater treatment system.

A gathering pipeline will be constructed from the platform to an onshore processing facility located near Nikiski. The construction activities will result in discharges associated with HDD, two barges to construct the pipeline (lay barge and a pipe barge), and three barges to set the platform (a platform barge and two crane barge). The HDD installation will result in a discharge of clay-based drilling fluids to the seafloor (Outfall 003). All five barges will discharge deck drainage (Outfalls 002B, 002C, 002D, 002E, and 002F) and the lay barge will also discharge fire control system test water (Outfall 004). All of these short-term construction discharges are included in the permit. Construction of the platform and pipeline are anticipated to begin in May 2014 and conclude in October 2014.

The discharge of wastes commonly associated with developing natural gas production wells has not been requested by the permittee in the permit application. The permit does not authorize the discharge of the waste streams that have not been identified in the permit application.

2.1 Estimated Effluent Characterization

Because this APDES permit is for new wastewater sources that do not have existing effluent or pilot plant data available for permit limit development, the permit application presents data from vendors on proposed treatment systems, data from similar production platforms located in Cook Inlet, and best professional judgment (BPJ) of treatment expected on the proposed treatment systems. The preliminarily proposed wastewater

treatment system for KLU Gas Production Platform A is a Red Fox marine sanitation device (MSD) that includes a biological treatment unit (MSD/BTU). Although the final treatment system has not be selected, the MSD/BTU establishes the level of treatment expected and meets the minimum treatment requirements established in Title 18, Chapter 72, Section 50 of the Alaska Administrative Code (18 AAC 72.050). Reference to MSD/BTU in this factsheet includes any treatment system that meets these minimum treatment requirements.

The maximum design personnel capacity for KLU Gas Production Platform A is 28 people and the maximum design personnel capacity for the seasonal MODU is anticipated to be 58 people. The resulting maximum daily flows will be 2,520 gallons per day (gpd) for Outfall 001A and 5,880 gpd for the seasonal MODU associated with Outfall 001B. Because the effluent from these treatment systems are expected to achieve similar levels of effluent quality and be combined into a single discharge port, the combined flow 8,400 gpd is used in the mixing zone analysis. Operation of a seasonal MODU domestic wastewater treatment system will achieve a comparable level of performance as the KLU Gas Production Platform A MSD/BTU. Therefore, permit limits for Outfall 001A and 001B will be identical. As described in the permit application, Table 1 provides an estimate of effluent characteristics for Outfall 001A and Table 2 provides an estimate for Outfall 001B.

Table 1: Effluent Characteristics for Outfall 001A, KLU Gas Production Platform A Domestic Wastewater

Average Monthly Flow	2,520 gpd
Average Biological Oxygen Demand, 5-day (BOD_5) Concentration:	30 milligrams per liter (mg/L)
Average Total Suspended Solids (TSS) Concentration:	30 mg/L
Average pH:	7.5 Standard Units (SU)
Average Total Residual Chlorine (TRC) Concentration:	0.0075 mg/L
Average Total Organic Carbon (TOC) Concentration:	75 mg/L

Table 2: Effluent Characteristics for Outfall 001B, Seasonal MODU Domestic Wastewater

Average Monthly Flow	5,880 gpd
Average BOD_5 Concentration:	30 mg/L
Average TSS Concentration:	30 mg/L
Average pH:	7.5 SU
Average TRC Concentration:	0.4 mg/L
Average TOC Concentration:	75 mg/L

During commissioning of the platform or drilling activities using the seasonal MODU, the KLU Gas Production Platform A is anticipated to discharge domestic wastewater up to the average flow rates listed in Table 2 and Table 3. However, once the facility becomes fully operational, KLU Gas Production Platform A may become unmanned for prolonged periods of time where maintenance staff may visit the facility approximately

three times per week to conduct system checks and perform routine maintenance. The permit accounts for this transition by frontloading certain monitoring requirements and setting personnel staffing triggers to accelerate other monitoring requirements when seasonal drilling or maintenance increases staffing levels at the facility.

KLU Gas Production Platform A will have a deck drainage discharge (Outfalls 002A) over the full term of the permit. Staffing levels discussed previously will have similar implications for Outfall 002A. However, deck drainage discharges from the construction barges (Outfalls 002B, 002C, 002D, 002E, and 002F) will occur during pipeline installation and be intensive but short-lived. Table 3 provides an estimate of effluent characteristics of deck drainage covered in the permit.

Table 3: Effluent Characteristics for Outfalls 002A -002F, Deck Drainage

Maximum Daily Flow – Platform A (Outfall 002A)	1,000 gpd
Maximum Daily Flow – Seasonal MODU (No Discharge)	N/A
Maximum Daily Flow – 60 person Pipe Lay Barge (Outfall 002B)	750 gpd
Maximum Daily Flow – Pipe Barge (Outfall 002C)	750 gpd
Maximum Daily Flow – six person Crane Barge (Outfall 002D)	1,750 gpd
Maximum Daily Flow – five person Crane Barge (Outfall 002E)	750 gpd
Maximum Daily Flow – Platform Barge (Outfall 002F)	1,750 gpd
Average Winter Temperature (Outfalls 002A only)	4º C
Average Summer Temperature	13º C

Pipeline construction will require a transition from an onshore to offshore setting using HDD commencing from atop a bluff and penetrating to the seafloor. The HDD will be completed in two steps involving drilling a 12-inch pilot borehole and then reaming the borehole to 24 inches. When the pilot borehole penetrates the seafloor, a maximum of 76,000 gallons of drilling fluids and cuttings could be discharged to the seafloor from the borehole with a large volume of material discharged immediately after penetration and then small amounts of material continuing to discharge for several days thereafter. Once the pilot borehole is drilled, the 24-inch ream borehole will follow. Because the pilot borehole provides a conduit for the discharge of clay-based drilling fluids, there will be a constant discharge of fluids and cuttings to the seafloor while reaming the pilot borehole. The discharge of material discussed in this paragraph will result in a zone of deposit from the larger sized cuttings and an increase in turbidity from the smaller sized cuttings and clay-based drilling fluids.

The clay-based drilling fluids and drill cuttings will consist mostly of water, bentonite, and ground-up fragments of the onshore subsurface created during drilling. Depending on onshore soil conditions, trace amounts of additives may be added to the clay mixture to improve fluid properties. Typical additives include natural and modified polymers such as starches, cellulose, zanthium, and guar gums for modifying viscosity, and soda ash and other chemicals to adjust pH. Table 4 provides characteristics for the drilling fluid submitted in the permit application.

Table 4: Effluent Characteristics for Outfall 003, Clay-based Drilling Fluids and Cuttings

Estimated Maximum Volume for 12-inch Pilot Borehole	76,000 gallons (over 5 to 10 day period)
Estimated Maximum Volume for 24-inch Ream Borehole	1,000,000 gallons (over 15 to 25 day period)
Water	59 Percent (%)
Poorly Graded Sand (SP)	24 %
Silty Sand: (SM)	4 %
Poorly Graded Gravel (GP)	2 %
Low Plasticity Silt (ML)	2 %
Bentonite	2 %
Chemical Additives	Trace

The lay barge will have a fire control system in the event of a fire. This system will use direct seawater and must be tested periodically by starting the seawater pumps and discharging overboard (Outfall 004). The volume of these periodic test discharges is approximately 150 gpd.

3.0 EFFLUENT LIMITS AND MONITORING REQUIREMENTS

3.1 Basis for Permit Effluent Limits

The CWA requires that the limits for a particular pollutant be the more stringent of either technology-based effluent limits (TBEL) or water quality-based effluent limits (WQBEL). TBELs are set via EPA-rule makings in the form of Effluent Limitation Guidelines (ELG) and correspond to the level of treatment that is achievable using available technology. In situations where ELGs have not been developed or have not considered specific discharges or pollutants, a regulatory agency can develop case-by-case TBELs based on BPJ. A WQBEL is designed to ensure that the Alaska Water Quality Standards codified in 18 AAC 70 (WQS) are maintained and protected for the water body. WQBELs may be more stringent than TBELs. In cases where both TBELs and WQBELs have been generated, the more stringent of the two limits will be selected as the final permit limit. The permit primarily contains TBELs based on BPJ and one WQBEL for pH.

EPA has established ELGs for oil and gas point sources in 40 CFR 435. The ELGs in 40 CFR 435 are adopted by reference at 18 AAC 83.010(b)(g)(3). The permit incorporates applicable TBELs to this permitting action and includes additional permit stipulations for any specific waste stream or pollutant not considered by the ELG. The maximum daily TBEL-based limit of 1.0 mg/L for TRC on Outfalls 001A and 001B were also developed based on case-by-case BPJ. The ELGs from 40 CFR 435.13 are adopted based on case-by-case BPJ based on best available economically achievable technology (BAT) and best conventional pollutant control technology (BCT). The basis for limits of Domestic Wastewater Outfalls 001A and 001B also incorporate minimum treatment requirements per 18 AAC 72.050 for BOD5 and TSS. However, the weekly discharge limits per 18 AAC 72 were not included because average monthly and maximum daily limits are sufficient to control these pollutants in the discharge.

The permit stipulates no discharge of free oil in all discharges. The limitation of no discharge of free oil is determined by the presence of film, sheen, or a discoloration of the surface of the receiving water for deck drainage discharges. In situations where the observation of sheen on the water surface is not appropriate, the permit requires conducting the Static Sheen Test per 40 CFR 435, Subpart D, Appendix 1. Deck drainage contaminated with oil and/or grease must be treated using an oil-water separator, or other means, prior to discharge. See Appendix B for a more in-depth technical and regulatory discussion regarding the basis for permit limits.

3.2 Basis for Effluent and Receiving Water Monitoring

In accordance with AS 46.03.110(d), the Department may specify in a permit the terms and conditions under which waste material may be disposed in a permit. Monitoring in a permit is required to determine compliance with effluent limits but may also be required to gather effluent and receiving water data to determine if additional effluent limits are required and/or to monitor effluent impacts on the receiving water body quality.

3.3 Effluent Limits and Monitoring Requirements

3.3.1 Domestic Wastewater Outfalls 001A and 001B

Table 5: Outfalls 001A and 001B: Effluent Limits and Monitoring Requirements

	Effluent Limits				Monitoring Requirements		
Parameter	**Daily Minimum**	**Monthly Average**	**Daily Maximum**	**Units**	**Sample Location**	**Sample Frequency**	**Sample Type**
Total Discharge Flow	N/A	Report	Report	gpd	Effluent	1/Month	Continuous
BOD_5	N/A	30	60	mg/L	Effluent	1/Month [a,]	Grab or Composite [b]
TSS	N/A	30	60	mg/L	Effluent	1/Month [a,]	Grab or Composite [b]
TRC	---	N/A	1.0 [c]	mg/L	Effluent	1/Month	Grab
TRC	1.0 [d]	N/A	---	mg/L	Effluent	1/Month	Grab
pH	6.5	N/A	8.5	SU	Effluent	1/Month	Grab
Floating Solids	No Discharge			---	Receiving Water	1/Day [e]	Observation [f]
Foam	No Discharge			---	Receiving Water	1/Day [e]	Observation [g]
Garbage	No Discharge			---	Receiving Water	1/Day [e]	Observation [g]
Oily Sheen	No Discharge			---	t Receiving Water	1/Day [e]	Observation [g]
Fecal Coliform Bacteria	N/A	N/A	Report	Count (Ct) per /100 mL	Effluent	1/Month	Grab
Enterococci Bacteria	N/A	N/A	Report	Ct per /100 mL	Effluent	1/Month	Grab

Table 5: Outfalls 001A and 001B: Effluent Limits and Monitoring Requirements

	Effluent Limits				Monitoring Requirements		
Parameter	**Daily Minimum**	**Monthly Average**	**Daily Maximum**	**Units**	**Sample Location**	**Sample Frequency**	**Sample Type**

Notes:

a. Effluent sampling frequency for BOD_5 and TSS is increased to weekly when the Seasonal MODU is connected to the KLU Gas Production Platform A.

b. Composite samples must consist of at least eight grab samples proportional to flow collected at approximately equally spaced intervals.

c. The 1.0 mg/L daily maximum limit is measured after dechlorination and before combining with other discharges.

d. TRC is a surrogate parameter for fecal coliform and enterococci bacteria. For KLU Gas Production Platform A and the Seasonal MODU, maintain as close to the minimum limit concentration of 1.0 mg/L as possible and measure immediately after chlorination.

e. Only when discharges occur.

f. The permittee must monitor by observing the surface of the receiving water in the vicinity of the outfall(s) during daylight at the time of maximum estimated discharge and during conditions when observation on the surface of the receiving water is possible in the vicinity of the discharge. Observations must follow either the morning or midday meal. Observations must be recorded in daily operating logs and made available upon request by DEC.

g. The permittee must monitor by observing the surface of the receiving water in the vicinity of the outfall(s) during daylight at a minimum frequency of once per day. Monitoring of the effluent for foam, garbage, and oily sheen is to determine compliance with narrative effluent limits. Observations must be recorded in daily operating logs and made available upon request by DEC.

h.

The permit requires monitoring of the effluent at Outfalls 001A and 001B for BOD_5, TSS, pH, and TRC to determine compliance with the numeric effluent limits. In addition, the permit includes requirements to monitor the effluent for flow, and fecal coliform and enterococci bacteria in order to evaluate hydraulic loads and to conduct a future reasonable potential analysis to determine if the discharge of bacteria might cause, or contribute to an exceedance of water quality criteria in the receiving water body.

3.3.2 Deck Drainage Outfalls 002A and 002B through 002F

The deck drainages from the KLU Gas Production Platform A (Outfalls 002A) will occur during the five year permit term. However, the deck drainage from the construction barges, discharges 002B through 002F as shown in Table 3, will only be discharged during construction of the pipeline. Due to the short duration of permit coverage for Outfalls 002B through 002F, limits, monitoring, and reporting requirements will differ slightly from the longer term discharges associated with Outfall 002A. The effluent limits and monitoring requirements for Outfalls 002A through 002F are presented in Table 6.

Table 6: Deck Drainage Discharge Outfalls 002A and 002B Through 002F: Effluent Limits and Monitoring Requirements

	Effluent Limits				Monitoring Requirements		
Parameter	**Daily Minimum**	**Monthly Average**	**Daily Maximum**	**Units**	**Sample Location**	**Sample Frequency**	**Sample Type**
Total Discharge Flow	N/A	Report	Report	gpd	Effluent	Monthly	Estimated
Free Oil [a, b, c]	No Discharge			---	Effluent	Daily [d]	Visual
Whole Effluent Toxicity (WET) Testing [e]	Report			Chronic Toxicity Unit (TUc)	Effluent	Once per First Two Years	See Section 3.3.2.1

Notes:

a. The permittee must monitor by observing the surface of the receiving water in the vicinity of the outfall(s) during daylight at the time of maximum estimated discharge and during conditions when observation on the surface of the receiving water is possible in the vicinity of the discharge. Visual tests must be recorded in daily operating logs and made available upon request by DEC.

b. For 002A: Deck drainage must be treated using an oil water separator (OWS) prior to discharge. If discharge occurs during broken or unstable ice conditions or during stable ice conditions, the Static Sheen Test must be used (see 40 CFR Part 435 Subpart A, Appendix 1) and a grab sample is required. Results must be recorded on Discharge Monitoring Reports (DMRs) and submitted monthly to DEC.

c. For 002B through 002F: Deck drainage must be treated to remove free oil prior to discharge. Monitoring results must be recorded on DMRs and submitted with the End of Construction Report (See Section 3.4).

d. Daily when discharging and the facility is manned. The monitoring frequency is reduced to weekly when the facility is unmanned.

e. WET testing is applicable to Outfall 002A only. Samples must be collected downstream of the OWS during periods of significant rainfall or snowmelt.

3.3.2.1 Chronic WET Monitoring:

The permittee must conduct chronic WET monitoring once per year for the first two years of discharge from Outfall 002A during the permit term. The permittee must conduct WET tests on effluent grab samples using one vertebrate and two invertebrate species, as follows:

- Vertebrate (survival and growth): Atherinops affinis (Topsmelt). In the event that topsmelt is not available, Menidia beryllina (inland silverside) may be used as a substitute. The permittee shall document the substitute species in the DMR following the testing.
- Invertebrate: For larval development tests, the permittee must use bivalve species Crassostrea gigas (Pacific Oyster) or Mytilus sp. (mussel). For fertilization tests the permittee must use echinoderms Strongylocentrotus purpuratus (purple sea urchin) or Dendraster excentricus (sand dollar). Due to seasonal variability, testing may be performed during reliable spawning periods (e.g. December through February for mussels and June through August for oysters).

The presence of chronic toxicity must be estimated as specified in USEPA *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms*, Third Edition (EPA-821-R-02-014). For the bivalve species, chronic toxicity must be estimated as specified in *Short-Term Methods for Estimating the Chronic Toxicity of*

Effluents and Receiving Water to West Coast Marine and Estuarine Organisms (EPA/600/R-95/136).

Results must be reported in TUc, where TUc = 100/IC_{25}. The reported IC_{25} must be the lowest IC_{25} calculated for the applicable survival, growth or fertilization endpoints.

A series of at least five dilutions and a control must be tested. The dilution series must be designed to provide useful toxicity information for evaluation during permit reissuance.

In addition to those quality assurance measures specified in the methodology, the following quality assurance procedures must be followed:

- If organisms are not cultured by the testing laboratory, concurrent testing with reference toxicants must be conducted, unless the test organism supplier provides control chart data from at least the last 5 months of reference toxicant testing. Where organisms are cultured by the testing laboratory, monthly reference toxicant testing is sufficient.
- If either of the reference toxicant tests or the effluent tests does not meet all test acceptability criteria as specified in the test methods manual, then the permittee must re-sample and re-test as soon as possible.
- Control and dilution water should be receiving water or salinity adjusted lab water. If the dilution water used is different from the culture water a second control using culture water must also be used.

3.3.3 HDD Outfall 003

Due to unique differences between the pilot borehole and the ream borehole, the limits and monitoring of clay-based fluids and drill cuttings are considered separately. However, the permit requirements for developing and implementing a Drilling Fluids Plan (DFP) and maintaining a chemical inventory are applied uniformly.

Table 7: HDD Discharge Outfall 003 Clay-based Fluids and Cuttings at the Seafloor: Effluent Limits and Monitoring Requirements

	Effluent Limits		Monitoring Requirements		
Parameter	**Limits**	**Units**	**Sample Location**	**Sample Frequency**	**Sample Type**
Total Discharge Flow [a]	Report	gpd	Effluent	Continuous	Estimated
Free Oil (Pilot Borehole)[b, c]	No Discharge	---	Effluent	Prior to Discharge	Grab
Free Oil (Ream Borehole)[d]	No Discharge	---	Effluent	While Discharging	Visual
Chemical Inventory [e]	See Section 3.3.3.2	---	---	Monthly	Calculation

Notes:

a. The permittee must maintain a daily log while conducting HDD activities to record estimated flows and volumes, monitoring results, visual observations, and chemical usage. The information must be made available to DEC immediately upon request and summarized in the End of Construction Report (See Section 3.4)

b. The permittee shall collect a sample at the mud pit and conduct a Static Sheen Test within six hours prior to discharging the contents of the pilot borehole. Report the date and time of the sample and the one-time discharge, the total estimated discharge and Static Sheen Test results in the End of Construction Report (See Section 3.4).

c. While drilling the pilot borehole beneath the shoreline, the permittee must monitor the shoreline for the presence of clay-based fluids and cuttings during low tide periods. The permittee must contact DEC immediately if deposits or seeps of clay based drilling fluids and cuttings are observed along the shoreline.

d. The permittee must monitor by observing the surface of the receiving water in the vicinity of the discharge during daylight hours during low and high slack tides. Observations must be made at least daily and be recorded in daily operating log. Visual sheen tests must be recorded on monthly DMRs and submitted in the End of Construction Report (See Section 3.4).

e. The use of chemical additives in the fluid system is prohibited unless approved by the Department. See Section 3.3.3.1. All chemicals used in the project and volume calculations must be included in the Chemical Inventory and submitted with the End of Construction Report (See Sections 3.3.3.2 and 3.4).

3.3.3.1 Drilling Fluid Plan Requirements:

The permit requires the development and implementation of a DFP. The basis for the DFP requirement is Sections 308 and 403(c) of the CWA. The DFP requirement is also based upon the Pollution Prevention Act (PPA) and its policy of prevention, reduction, recycling, and treatment or wastes (PPA Section 102(b)) through measures that include process modification, materials substitution, and improvement of management (PPA Section 107(b)(3)).

A goal of the DFP is to ensure that personnel on-site are knowledgeable about the information needed and the methods required to formulate the drilling fluids/chemical additive systems to minimize addition of toxic substances and meet the toxicity requirements of the permit. The plan must be implemented during drilling operations and a copy of the plan must be available on-site at the HDD facility at all times.

The permittee must develop and implement a written procedural plan for the formulation and control of drilling fluid/chemical additive systems for the HDD program. The DFP must specify the drilling fluid/chemical additive systems to be used. The DFP also requires clearly stated procedures for situations where additives not originally planned for or included in the toxicity estimations are proposed for use later, and whether any new additive may be used and discharged. The criteria for making changes to

the additive make up of a drilling fluid system must be specified in the DFP. No chemical additives that have not been approved by the Department can be discharged. The DFP is to be submitted to Department 15 days prior to discharge.

3.3.3.2 Chemical Inventory:

For each fluid mixture discharged, the permittee must maintain a precise chemical inventory of all constituents added, including all additives used to meet specific drilling requirements. The permittee is required to maintain a chemical inventory of chemical additives used and their amounts and submit this information in the end of Project Report (Section 4.3.3). The permittee must maintain these records and make them available to DEC upon request.

3.3.4 Fire Control System Test Water Outfall 004

Because fire control system test water uses natural seawater, the prohibitions are based on no discharge of free oil and no use of chemical additives. Table 8 describes the limits and monitoring for Outfall 004.

Table 8: Fire Control System Test Water Outfall 004: Effluent Limits and Monitoring Requirements

	Effluent Limits				Monitoring Requirements		
Parameter	**Daily Minimum**	**Monthly Average**	**Daily Maximum**	**Units**	**Sample Location**	**Sample Frequency**	**Sample Type**
Total Discharge Flow	N/A	Report	Report	gpd	Effluent	Monthly	Estimated
Free Oil [a]	No Discharge			---	Effluent	Daily [b]	Visual
Chemical Additives [c]	Prohibited				Effluent	---	---

Notes:

a. The discharge of fire control system test water is limited to those times when a visible observation on the water surface is possible. The permittee must monitor by observing the surface of the receiving water in the vicinity of the outfall during daylight at the time of maximum estimated discharge and slack tide conditions. Observations of visual sheen, floating solids, foam, and garbage must be recorded in daily operating logs and made available upon request by DEC. The permittee must record results on DMRs and submit them in the End of Construction Report (See Section 3.4).

b. When Discharging.

c. The use of chemical additives in the fire control system test water is prohibited.

3.4 End of Construction Report:

The permittee is required to submit an annual report within 30 days after the end of pipeline and platform installation as determined by the last day of reporting a construction related discharge under the permit. The report must cover discharges for construction barge deck drainage (Outfall 002B through 002F) and fire control system test water (Outfall 004) as well as HDD (Outfall 003). For Outfalls 002B through 002F and 004, the permittee shall report the following.

- Monthly DMRs for referenced outfalls, and
- Total volumes discharge per outfall during the construction season.

The permittee shall report the following for each borehole and drilling fluid mixture discharged:

- Beginning drill date, completion date, and borehole diameter;
- A precise chemical inventory of all constituents added downhole, including all drilling fluid additives used to meet specific drilling requirements;
- The base drilling fluid type and material specifications;
- The name and total amount of each constituent in the discharged drilling fluid;
- The maximum concentration of each constituent in the drilling fluid;
- The total volumes of drilling fluid created and added downhole;
- The total volumes of drilling fluid discharged to surface waters;
- The estimated amount of each constituent in the drilling fluid discharged;
- Any unusual observations reported to DEC,
- Any DFP field modifications requested by the permittee and approved by the Department, and
- Any supplemental information requested by DEC.

3.5 Additional Monitoring

Monitoring frequencies are based on the nature and effect of the pollutant and a determination of the minimum sampling necessary to adequately monitor facility performance. The permittee has the option of taking more frequent samples than required under the permit. These additional samples can be used for averaging if they are conducted using the Department – approved test methods (generally found in 18 AAC 70 and 40 CFR Part 136 [adopted by reference in 18 AAC 83.010]), and if the method detection limits are less than the corresponding effluent limits.

4.0 RECEIVING WATER BODY

4.1 Water Quality Standards

Section 301(b)(1)(C) of the CWA requires the development of limits in permits necessary to meet water quality standards by July 1, 1977. Regulations in 18 AAC 83.435 require that conditions in permits ensure compliance with WQS. The WQS are composed of water body use classifications, numeric and/or narrative water quality criteria, and an antidegradation policy. The use classification system designates the beneficial uses that each water body is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary by the state to support the beneficial use classification of each water body.

Water bodies in Alaska are designated for all uses unless the water has been reclassified under 18 AAC 70.230 as listed under 18 AAC 70.230(e). Some water bodies in Alaska can also have site–specific water quality criterion per 18 AAC 70.235, such as those listed under 18 AAC 70.236(b). The Department has determined that there has been no reclassification nor has site-specific water quality criteria been established at the location of the permitted facility in Cook Inlet. The Department has determined that all of the marine use classes must be protected in state waters in Cook Inlet.

An Ocean Discharge Criteria Evaluation (ODCE) is not required for KLU Gas Production Platform A. 40 CFR 125, Subpart M requires an ODCE for a point source that occurs seaward of the baseline of the territorial sea. Because KLU Gas Production Platform A is landward of the baseline, the ODCE requirement does not apply.

4.2 Water Quality Status of Receiving Water

Any part of a water body for which the water quality does not, or is not expected to, intrinsically meet applicable WQS is defined as a "water quality limited segment" and placed on the state's impaired water body list. For an impaired water body, Section 303(d) of the CWA requires states to develop a Total Maximum Daily Load (TMDL) management plan for the water body. The TMDL documents the amount of a pollutant a water body can assimilate without violating WQS and allocates that load to known point sources and nonpoint sources.

Cook Inlet is not included on the *Alaska's Final 2010 Integrated Water Quality Monitoring and Assessment Report*, July 15, 2010 as an impaired water body nor is the subject water body listed as a CWA 303(d) water body requiring a TMDL.

4.3 Mixing Zone Analysis

In accordance with state regulations at 18 AAC 70.240 – 70.270, as amended through June 23, 2003 (mixing zone regulations) the Department, at their discretion, may authorize a mixing zone. The applicant submitted a request for a mixing zone for domestic wastewater discharges via a mixing zone application on February 27, 2013. The Mixing Zone Application provides information required by 18 AAC 70.260 (application requirements), including the information and available evidence necessary to demonstrate consistency with mixing zone regulations.

The applicant used the Cornell Mixing Zone Expert System (CORMIX)8.0G mixing zone model with input data representing critical ambient conditions in Cook Inlet and estimated effluent characteristics of the subject waste streams. Because there is no effluent data currently available, the applicant used the maximum daily limit of 1.0 mg/L for TRC to estimate the mixing zone size. The Department determined this approach is appropriate based on an understanding that dechlorination is required and the limit for chlorine requires a minimum of 1.0 mg/L, and maintained as close as possible to this concentration. Given the above, 1.0 mg/L of TRC represents a worst case concentration in the effluent.

The applicant submitted the mixing zone study "*KLU Production Platform and Spartan 151 (Seasonal MODU) Treated Sanitary/Domestic Discharge Modeling*" to support the mixing zone application and provide the Department information to determine an appropriately sized mixing zone. Based on the Department's interpretation of the modeling results, a mixing zone for the combined domestic wastewater discharges for Outfalls 001A and 001B is authorized to have an acute and chronic mixing zone for TRC. The authorized acute and chronic dilution factors are 80 and 140, respectively. The acute mixing zone configuration is a cylinder extending from the sea surface to the sea floor with a radius of 11 meters centered at the point of discharge. The chronic mixing zone configuration is a cylinder extending from the sea surface to the sea floor with a radius of 20 meters centered at the point of discharge. Water quality criteria must be met at the boundary of the authorized mixing zone.

The applicant submitted a Memorandum on Sediment and Turbidity Discharges Associated with HDD to the Department to support evaluation of mixing zones for the HDD discharges. This memo provided a breakdown of particle sizes in the discharges, including which particles are expected to settle and require a zone of deposit (cuttings) and which particles are expected to remain in suspension and require a mixing zone for turbidity (fluids). The memo also provided estimates on the size of two turbidity plumes, one associated with the pilot borehole and the other the ream borehole.

Appendix E, Mixing Zone Analysis Checklist, outlines criteria per mixing zone regulations that must be considered when the Department reviews an application for mixing zones. These criteria include consideration of the size of the mixing zone, treatment technology, and existing uses of the water body, human consumption, spawning areas, human health, aquatic life, and endangered species. All criteria must be met in order to authorize a mixing zone.

The following summarizes the Department's regulatory mixing zone analysis:

4.3.1 Size

In accordance with 18 AAC 70.255, the Department determined that the size of the regulatory mixing zone (as described above) for the domestic discharges from KLU Gas Production Platform A wastewater discharge is appropriate and is as small as practicable based on worst case effluent concentrations of TRC and critical ambient receiving water conditions. The average seafloor depth in the vicinity of the Platform is 35 meters and the outfall height is nine meters above the seafloor. Critical discharge rates were calculated based on a range of staffing levels on KLU Gas Production Platform A and the seasonal MODU. The

minimum domestic wastewater discharge rate of 420 gpd corresponds to minimum KLU Gas Production Platform A staffing. The maximum combined domestic wastewater discharge rate of 8,400 gpd corresponds to maximum combined staffing of KLU Gas Production Platform A coupled with the staffing of the seasonal MODU. The assumed discharge density 998 kilogram per meter cubed is representative of fresh water at 20°C, which is typical for this type of discharge. Critical ambient tidal velocities of 2.3 meters per second (m/s) and 0.2 m/s representing the 90th and 10th percentiles, respectively, were used in the model. These ambient tidal velocities are based on previous mixing zone studies conducted in the vicinity of the discharge. Using the 10^{th} percentile tidal velocity of 0.2 m/s, a drifting organism can traverse the 11 meter acute mixing zone in 100 seconds, which is less than 15 minutes typically used to determine where lethal effects could occur (18 AAC 70.255).

Because the fluids and cuttings in the pilot borehole will be under significant hydrostatic pressure, the discharge is expected to be initially rapid but will taper off to a trickle in short period of time post borehole penetration. This initial high energy discharge will create a larger plume than what can be expected for the remainder of the discharge. This is because the ream borehole will not be discharged with as high a pressure but will be of longer duration. Therefore, the Department is authorizing two mixing zones, a larger mixing zone for the initial pilot borehole discharge and a smaller mixing zone for the ream borehole discharge. The authorized chronic turbidity mixing zone for the pilot borehole HDD discharge is rectangular, and 645 meters wide by 1,000 meters long in each current direction. The authorized chronic mixing zone for the ream borehole HDD discharge is 645 meters in radius. The ream borehole mixing zones are sized using radii given the discharge will be continuous and multiple tidal cycles are expected to influence the shape; whereas, the pilot hole discharge will be less effected by tidal cycles due to the shorter duration of discharge.

Because the HDD mixing zones were determined using critical effluent and receiving water conditions, the mixing zones are as small as practicable.

4.3.2 Technology

18 AAC 70.240(a)(3) requires the Department to determine if "an effluent or substance will be treated to remove, reduce, and disperse pollutants, using methods found by the department to be the most effective and technologically and economically feasible, consistent with the highest statutory and regulatory treatment requirements" before authorizing a mixing zone.

Applicable "highest statutory and regulatory requirements" are defined in 18 AAC 70.990(30) [2003]. Accordingly, there are three parts to the definition, which are:

- Any federal TBEL identified in 40 CFR 125.3 and 40 CFR 122.29, as amended through August 15, 1997, adopted by reference at 18 AAC 83.010;
- Minimum treatment standards in 18 AAC 72.040; and

- Any treatment requirement imposed under another state law that is more stringent than the requirement of this chapter.

The first part of the definition includes all applicable federal technology-based ELGs, as found in 40 CFR Part 435 Subpart D, adopted by reference at 18 AAC 83.010(g)(3). The case-by-case TBELs developed based on BPJ for domestic wastewater discharges for BOD5 and TSS for Outfall 001A and Outfall 001B are based in regulation at 18 AAC 72.050 and the definition of secondary treatment as per 18 AAC 72.990(59) and comply with minimum treatment standards in 18 AAC 72.050. Furthermore, the ELGs at 40 CFR 435 require a minimum concentration of 1.0 mg/L of TRC immediately after chlorination to effectively treat bacteria present in the waste stream, and that the TRC concentration must be maintained as close as possible to 1.0 mg/L. Dechlorination is necessary to ensure water quality criteria for TRC is met at the boundary of the mixing zone.

The second part of the definition from the WQS appears to be in error, as 18 AAC 72.040 considers discharge of sewage to sewers and not minimum treatment. The correct reference appears to be 18 AAC 72.050, minimum treatment for domestic wastewater. Per 18 AAC 72,050, the domestic wastewater from KLU Gas Production Platform A and seasonal MODU will be treated through a MSD/BTU, which includes secondary biological treatment and dechlorination before being discharged into the Cook Inlet via Outfall 001A and Outfall 001B. Although the exact MODU to be used is currently unknown, the permit requires that the domestic wastewater treatment system attain minimum treatment as defined in 18 AAC 72.050, which satisfies the second part of the definition. As verified during plan review, the treatment system on the seasonal MODU will achieve minimum treatment and similar performance as the MSD/BTU on the KLU Gas Production Platform A. Both the KLU Gas Production Platform A and seasonal MODU domestic wastewater treatment systems must be approved by the Department prior to discharging per 18 AAC 72.200.

The third part of the definition includes any treatment required by state law that is more stringent than 18 AAC 70. Other regulations beyond 18 AAC 70 that may apply to this permitting action include 18 AAC 83, 18 AAC 72 and 18 AAC 15. The paragraph above speaks directly to the more stringent treatment requirements contained in 18 AAC 72 for domestic wastewater discharges. The requirement to submit engineering plans and reports prior to discharging domestic wastewater also resides in 18 AAC 72. Further, the permit is consistent with 18 AAC 83. In addition, neither the regulations in 18 AAC 15 nor another state legal requirement that the Department is aware of impose more stringent treatment requirements than 18 AAC 70 besides those in 18 AAC 72, which are addressed in the paragraph above.

4.3.3 Existing Use

In accordance with 18 AAC 70.245, the mixing zone has been appropriately sized to fully maintain and protect existing receiving water uses. The discharge volumes and ambient receiving water characteristics at the discharge location have been examined to ensure the biological integrity of Cook Inlet as a whole is protected.

Reportedly, there is a set net lease approximately 0.75 miles from the HDD discharge location. The mixing zone for the HDD discharge from the pilot borehole will not overlap with the seasonal use of the lease and is expected to be of very short duration. Based on the volume of effluent discharged, the large tidal fluctuations and flushing occurring in Cook Inlet, the small size of the authorized mixing zones, and the short durations DEC has determined that the existing uses and biological integrity of the water body will be maintained and fully protected under the terms of the permit as required in 18 AAC 70.245 (a)(1) and (a)(2).

4.3.4 Human Consumption

In accordance with 18 AAC 70.250(b)(2) and (b)(3), the subject pollutants will not produce objectionable color, taste, or odor in aquatic resources harvested for human consumption; nor will the discharge preclude or limit established processing activities or commercial, sport, personal use, or subsistence fish and shellfish harvesting. Significant flushing in Cook Inlet is expected to rapidly disperse the low-volume discharges predominately composed of conventional pollutants.

4.3.5 Spawning Areas

Per 18 AAC 70.255(h), a mixing zone is not authorized in an area of anadromous fish spawning or resident fish spawning redds for Arctic grayling, northern pike, rainbow trout, brook trout, cutthroat trout, whitefish, sheefish, Arctic char (Dolly Varden), burbot, and landlocked coho, king, and sockeye salmon. The permit does not allow the discharge of effluent to open waters of a freshwater lake or river. Therefore, there are no associated discharges to anadromous fish spawning areas or the resident freshwater fish listed in the regulation.

4.3.6 Human Health

In accordance with 18 AAC 70.250 and 18 AAC 70.255, the mixing zone shall be protective of human health and will not result in pollutants discharged at levels that will bioaccumulate, bioconcentrate, or persist above natural levels in sediments, water, or biota or at levels that otherwise will create a public health hazard through encroachment on a water supply or contact recreation uses. Under the conditions of the permit, the pollutants discharged will not produce objectionable color, taste, or odor in aquatic resources harvested for human consumption. Furthermore, the pollutants discharged will not preclude or limit established processing activities of commercial, sport, personal-use, or subsistence fish and shellfish harvesting.

An analysis of the wastewater discharge application and mixing zone application indicate that the level of treatment at KLU Gas Production Platform A and Seasonal MODU is protective of human health. Similarly, analysis of the proposed HDD wastewater discharges and the mixing zone application indicates the discharges along with the limitations and requirements of the permit are protective of human health.

4.3.7 Aquatic Life and Wildlife

In accordance with 18 AAC 70.250(a)(2)(A-C), 18 AAC 70.250(b)(1), 18 AAC 70.255(g)(1) and (2), and 18 AAC 70.255(b)(1) and (2), pollutants for which the mixing zone will be authorized will not result in concentrations outside of the mixing zone that are undesirable, present a nuisance to aquatic life, permanent or irreparable displacement of indigenous organisms, or a reduction in fish or shellfish population levels. Based on the mixing being sized as small as practicable to prevent lethality to drifting organisms (see Fact Sheet Section 5.3.1), low discharge volume, outfall structure and location, mixing zone, tidal fluctuations at the point of discharge and short discharge durations where applicable, the Department concludes aquatic life and wildlife will be maintained and protected.

4.3.8 Endangered Species

In accordance with 18 AAC 70.250(a)(2)(D), the mixing zone will not cause an adverse effect on threatened or endangered species. Impacts to overall water quality, and any threatened or endangered species therein, are not expected based on the small size of the mixing zone, the discharge characteristics, and the extreme tidal fluctuations associated with the receiving water. The National Marine Fisheries Service (NMFS) and the United States Fish and Wildlife Service (USFWS) indicated that there are two listed endangered species. The following endangered species may occur in Cook Inlet in the vicinity of the discharge: Cook Inlet Beluga Whale (Delphinapterus leucas) and Stellar Sea Lion (Eumetopias jubatus). See Section 8.1 and 8.2 for more information on endangered species.

4.4 Zone Of Deposit

The Department authorizes a 65 meter radius zone of deposit centered over the point of emergence in the seafloor for the HDD. Per 18 AAC 70.210(b), the Department reviewed information provided by the applicant, considered mitigation measures to reduce adverse impacts, and imposed prohibitions and requirements in the permit as part the authorization of the zone of deposit. The deposit will be composed of naturally occurring sand and gravel cuttings from the borehole with trace amounts of drilling fluids attached to the surface of the particles. The permit contains prohibitions for the discharge of oil, and the use of chemical additives is controlled by the DFP requirement and minimized by development and implementation of a BMP Plan. Due to the fine-grained nature of the clay-based fluids and cuttings and the natural seafloor scouring that occurs in this portion of Cook Inlet, the deposit is expected to be dispersed by the high energy tidal currents over the course of several tidal cycles. The Department has determined the nature and duration of the deposit is not expected to adversely impact the receiving water or other uses of the water body beyond the boundary of the authorized zone of deposit.

5.0 ANTIBACKSLIDING

5.1 Legal Basis

Per 18 AAC 83.480(a), except as provided in (b) of the section, "when a permit is renewed or reissued, interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit, unless the circumstances on which the previous permit was based have materially and substantially changes since the permit was issued, and the change in circumstances would constitute cause for permit modification or revocation and reissuance under 18 AAC 83.135."

18 AAC 83.480(b) only applies to effluent limitations established on the basis of CWA Section 402(a)(1)(B), and modification of such limitations based on effluent guidelines that were issued under CWA Section 304(b). Accordingly, 18 AAC 83.480(b) applies to the relaxation previously established case-by-case TBELs based on BPJ. To determine if the provisions of 18 AAC 83.480(b) can applied, the regulation provides five regulatory criteria (18 AAC 83.480[b][1-5]) DEC must evaluate.

Finally, the first sentence of 18 AAC 83.480(c) establishes that for a permit to which 18 AAC 83.480(b) applies, a permit "may not be renewed, reissued, or modified to contain an effluent limitation that is less stringent than required by effluent guidelines in effect at the time the permit is renewed, reissued, or modified." As established in the preceding paragraph, 18 AAC 83.480(b) does not apply; therefore, no further analysis is required. The second sentence of 18 AAC 83.480(c) indicates that case-by-case TBELs developed by BPJ may not be renewed, issued, or modified to contain a less stringent effluent limitation if implementation of the less stringent limitation would result in a violation of WQS.

This is the first issuance of this permit, therefore an antibacksliding analysis is not warranted.

6.0 ANTIDEGRADATION

Section 303(d)(4) of the CWA states that, for water bodies where the water quality meets or exceeds the level necessary to support the water body's designated uses, WQBELs may be revised as long as the revision is consistent with the State's antidegradation policy.

The antidegradation policy in the WQS (found at 18 AAC 70.015) states that the existing water uses and the level of water quality necessary to protect existing uses must be maintained and protected. This section of the fact sheet analyzes and provides rationale for the Department's decisions in the permit issuance with respect to the antidegradation policy.

The Department's approach to implementing the antidegradation policy, found in 18 AAC 70.015, is based on the requirements in 18 AAC 70 and the Department's *Policy and Procedure Guidance for Interim Antidegradation Implementation Methods, July 14, 2010 (Interim Methods).* Using these requirements and policies, the Department determines whether a water body, or portion of a water body, is classified as Tier 1, Tier 2, or Tier 3 where a higher numbered tier indicates a greater level of water quality protection. The receiving water for the discharges from the KLU Gas Production Platform A is Cook Inlet, which is a Tier 2 water.

Wastewater discharged under this permit is subject to a Tier 2 antidegradation analysis, as detailed in the *Interim Methods*. The State's antidegradation policy in 18 AAC 70.015(a)(2) states that if the quality of water exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water (Tier 2), that quality must be maintained and protected unless the Department finds that the five specific requirements of the antidegradation policy at 18 AAC 70.015(a)(2)(A)-(E) are satisfied. The Department's five findings are:

1. 18 AAC 70.015(a)(2)(A). *Allowing lower water quality is necessary to accommodate important economic or social development in the area where the water is located.*

   Based on the evaluation required per 18 AAC 70.015(a)(2)(D) below, the Department has determined that the most reasonable and effective pollution prevention, control, and treatment methods are being used and that the localized lowering water of quality is necessary.

   The 2009 Alaska Economic Performance Report written by the Department of Commerce, Community and Economic Development (DCCED) indicates that Alaska's oil and gas industry continues to be the largest source of state revenue while creating some of the highest paying jobs in the State (DCCED, 2011). The oil and gas extraction industry supports local economies by purchasing significant amounts of equipment, parts, fuel, food, freight, and other services.

   In addition, Alaska's Department of Natural Resources (DNR) tracks oil and gas activity in the State when it develops findings for lease sales (DNR, 2011). The January 2009 Best Interest Finding for the lease sale in Cook Inlet included the following socio-economic information on the oil and gas industry:

   - Oil and gas is an important component of revenues to support government services to Alaskans. At the end of the state's 2007 fiscal year, oil and gas revenues represented 88 percent of the total revenue to the state.

   - The Alaska state-wide economy depends heavily on revenues related to petroleum development, which totaled $4.57 billion in fiscal year 2007. The petroleum industry is Alaska's largest industry, annually spending $2.1 billion, including $422 million on payroll and $1.7 billion on goods and services.

   - Overall, this spending generates 33,600 jobs, $1.4 billion in payroll, and value added to the Alaska economy of $1.8 billion for total output of $3.1 billion. Oil and gas accounts for 12 percent of private sector jobs and 20 percent of private sector payroll. The oil and gas industry has the highest monthly wage in Alaska, averaging $7,754, which is 2.8 times higher than the statewide average of $2,798.

   - In the Matanuska-Susitna Borough, it is estimated that over 350 residents are employed by the oil and gas industry with an average monthly wage of $8,382. The economic impact of the oil and gas industry in the Matanuska-Susitna Borough was an additional 2,105 jobs for Matanuska-Susitna

residents, with a payroll of $84 million. The induced impacts were 1,558 jobs and $38 million in payroll. Total economic impact was estimated to be 4,016 jobs and $158 million for the Matanuska- Susitna Borough.

- In Anchorage, it is estimated that about 2,400 workers are employed by the oil and gas industry. Estimated total payroll is over $239 million with an additional $845 million in goods and services in the Anchorage economy. Indirect impact of the oil and gas industry is estimated to be 11,600 jobs and $431 million in payroll, with an induced impact of 2,320 jobs and $69 million in payroll.

- The oil and gas industry has been important to the economy of the Kenai Peninsula for over 40 years, and five of the top 10 employers are connected to the oil industry. Direct impact of the oil and gas industry has been estimated at 674 jobs with a payroll of $63 million. Indirect economic impacts are estimated to be an additional 2,822 jobs and $94 million in payroll. The induced impacts were 777 jobs and $20 million in payroll. Total economic impact on the Kenai Peninsula was 4,273 jobs and $177 million in payroll, which was 26 percent of the area's employment and 36 percent of the area's payroll. Taxable properties for the oil and gas industry were reported at $607 million, and 8 of the top 10 property tax payers in the borough were oil and gas industry companies.

- Demand for natural gas in the Cook Inlet area is projected to exceed supply by 2013 unless new reserves are discovered and developed. Decreasing supplies of Cook Inlet natural gas led to the closure of the Agrium fertilizer plant in 2007, resulting in the loss of 250 jobs in the Kenai Peninsula Borough. The liquefied natural gas (LNG) export license and supply contracts expired in 2011, and continued operation of the Kenai LNG plant may be jeopardized without long-term proven supplies of natural gas. The LNG Plant is still in a state of limbo, employing approximately 30 while waiting for proven gas resources to be developed. The LNG Plant employs approximately 75 at full production. Meanwhile, regional power utilities and resource development projects are developing contingency plans to use diesel instead of gas should sufficient gas not be secured. The switch to diesel for power generation will escalate user rates and increase the discharge of pollution into the air.

- Without increased Cook Inlet natural gas supplies, prices for residential and commercial natural gas and for electricity will continue to increase. Between 2000 and 2006, the price of natural gas increased 91 percent for Anchorage households, the cost of electricity increased 28 percent, and rates for home heating are expected to continue to rise as gas supplies deplete.

- The Furie production facility would provide natural gas from the KLU reservoir area to utility companies to heat homes, schools, government

facilities, military bases, and businesses as well as to generate electricity throughout the South-central Alaska region.

- It is estimated that the Furie project will generate 97 full-time and 62 part-time positions, including jobs directly related to development drilling, production and maintenance, administrative and management, completion operations, logistical support, and contractors in 2014. Further, it is estimated that the project will generate 113 full-time and 56 part-time positions in the same areas, in 2015 and beyond.

- The permittee estimates that the project will generate 12 full-time positions indirectly related to natural gas production (e.g., schools, banking, auto, housing, and stores) in 2014 and 18 full-time positions in 2015 and beyond.

The permittee indicated in its application submittal that anticipated production, to provide needed energy to Alaskan communities and industries, is projected at approximately 42 million cubic feet per day (MMCF/day) of natural gas in 2014, 85 MMCF/day in 2015 with the development of two additional wells in the KLU Reservoir Area, and 100 MMCF/day of sustained production in 2016 beyond.

The KLU Gas Production Platform A and seasonal MODU, upon installation, will be a natural gas production platform located in state waters in Cook Inlet. The Department finds that the lowering of water quality is necessary to accommodate important economic or social development in the area where the water is located and that the finding is met.

2. 18 AAC70.015 (a)(2)(B). Except as allowed under this subsection, reducing water quality will not violate applicable water quality criteria of 18 AAC 70.020 or 18 AAC 70.235, or the WET limit in 18 AAC 70.030.

   All applicable criteria found in 18 AAC 70.020 are met at the boundaries of the authorized mixing zones, ensuring that the quality of the water body as a whole is protected and maintained.

   The permit includes a TRC effluent limit of 1.0 mg/L (minimum) for TRC measured immediately after chlorination in accordance with 40 CFR 435. The minimum TRC limit is considered a surrogate parameter for fecal coliform and enterococci bacteria and the TRC concentration must be maintained as close as possible to 1.0 mg/L. DEC requires dechlorination prior to discharge. The permit also includes a maximum effluent limit of 1.0 mg/L developed on a case-by-case basis using BPJ and applied to the discharge after dechlorination and before discharge.

   Because the effluent limit for TRC is above applicable water quality criteria and assimilative capacity exists in the receiving water, the permit authorizes a regulatory mixing zone for TRC for the combined domestic wastewater discharged from KLU Gas Production Platform A and the seasonal MODU. Accordingly, the chronic and acute regulatory mixing zones have been approximately sized using a TRC concentration represented by the effluent limit and a critical discharge flow rate representing the maximum combined flows from the respective domestic treatment systems. The discharge of TRC into Cook Inlet was modeled using critical conditions

in the receiving water and TRC was demonstrated in the model to dissipate rapidly such that water quality criteria is met in a short distance from the outfall.

The fluid used during HDD is primarily bentonite clay and mineral silica. The discharge of clay-based drilling fluids and cuttings collectively with native onshore subsurface material will result in a zone of deposit on the seafloor for the larger particles discharged and a mixing zone for turbidity for the smaller particles discharged. The permittee is required to develop a DFP that considers the use of the least toxic chemicals to meet the required fluid properties of the drilling fluid. The Department authorizes two sets of mixing zones for turbidity based on the nature of the discharges from the HDD. The larger chronic turbidity mixing zone accounts for the initial high volume but short duration discharge when the pilot borehole emerges at the seafloor. The smaller chronic turbidity mixing zones accounts for the lower volume discharge over a longer duration while reaming is occurring and the borehole remains open. Both mixing zones are protective of water quality standards as the criteria for turbidity is met at the boundary of the respective chronic mixing zones.

Note that 18 AAC 70.235 pertains to site-specific criteria and site-specific criteria have not been developed for the subject water body. In addition, 18 AAC 70.030 pertains to WET limits and there are no WET limits or monitoring requirements contained in the permit; however, the only toxic parameter expected in the discharge(s), TRC, is regulated through effluent limits. Toxicity in the HDD discharges is controlled through requirements for submitting a DFP to the Department for approval prior to discharge and BMP implementation. Toxicity should not occur from these authorized discharges.

The Department has determined that this finding is met.

3. 18 AAC 70.015 (a)(2)(C). The resulting water quality will be adequate to fully protect existing uses of the water.

   As previously mentioned, Cook Inlet is protected for all marine use categories per 18 AAC 70.020(a)(2)(A-D). As most of the waste streams generated from the facility are transported to an onshore treatment and disposal facility, only low volumes of treated domestic wastewater and deck drainage will be discharged to Cook Inlet. The domestic wastewater treatment systems on the KLU Gas Production Platform A and the seasonal MODU will meet minimum treatment requirements per 18 AAC 72.050. The 1.0 mg/L effluent limits for TRC for the domestic discharges and appropriately sized chronic and acute mixing zones will ensure that water quality criteria will be met at the boundary of the authorized mixing zones ensuring that existing uses established in the WQS for Cook Inlet will be protected.

   Although a set net lease area is known to be present in the vicinity of the HDD discharge, the chronic turbidity mixing zone does not overlap with this lease area and the resulting water quality beyond the boundary of the mixing zone must meet the turbidity criteria contained in 18 AAC 70.020.

   Additionally, narrative permit limitations for floating, suspended or submerged matter, including oil and grease, also serve to protect uses for marine waters established at 18 AAC 70.020(a)(2)(A-D).

The Department has determined that this finding is met.

4. 18 AAC 70.015(a)(2)(D). The methods of pollution prevention, control, and treatment found by the Department to be most effective and reasonable will be applied to all wastes and other substances to be discharged.

   The most effective technological and economical pollution prevention, control, and treatment methods are used to disperse, treat, remove, and reduce pollutants. Of the 19 possible waste stream categories discussed in 40 CFR 435 for this industrial sector, the applicant plans to transport 15 of these waste streams to an onshore facility for treatment and disposal. The remaining discharges, (i.e., domestic wastewater, deck drainage, clay-based drilling fluids and cuttings at the seafloor and fire control system test water) represent the four types of discharges discussed herein and authorized by the permit. Alternative methods of treatment and disposal methods for domestic wastewater and deck drainage, such as injection wells and transportation of wastes to off-site treatment facilities, were eliminated due to financial and logistical considerations.

   The domestic wastewater discharges will meet minimum treatment requirements per 18 AAC 72.050. The KLU Gas Production Platform A treats domestic wastewater using a MSD/BTU that includes dechlorination. An MSD/BTU followed by dechlorination is the most effective and economical treatment for domestic wastewater at this facility. As previously stated, disinfection using chlorination is necessary to ensure adequate destruction of bacteria while subsequent dechlorination is necessary to ensure no more than 1.0 mg/L of TRC is discharged. The additional domestic wastewater from the seasonal MODU will be treated using a similar MSD/BTU treatment system and dechlorination before discharge. The MSD/BTU on the seasonal MODU will be reviewed by the Department prior to discharging to Cook Inlet to ensure that the system can meet the minimum treatment requirements consistent with the MSD/BTU treatment.

   Deck drainage includes discharges from the KLU Gas Production Platform A, seasonal MODU, the pipeline lay barge, two crane barges, and the platform barge. These discharges require oil removal prior to discharge to ensure compliance with the prohibition to discharge free oil. Consistent with 40 CFR 435, deck drainage authorized by the permit is prohibited from discharging free oil as determined by the visual sheen test, or static sheen test. When the discharge of deck drainage occurs during broken, unstable, or stable ice conditions, the effluent must pass the static sheen test and sampling is required. The permit requires the permittee to develop and implement a BMP Plan that includes procedures to ensure that toxic chemicals do not come in contact with deck drainage to prevent the discharges of chemicals in toxic amounts.

   The permit requires submittal and Department approval of a DFP that addresses the use of potentially toxic chemicals in drilling fluids and prohibits the discharge of free oil.

   For the purpose of discussing pollution prevention, control, and treatment the discharges covered by the permit will be grouped according to the following four categories:

A. HDD Clay-based Drilling Fluids and Drill Cuttings at the Seafloor
B. Domestic Wastewater
    i. Black Water
C. Discharges potentially contaminated with oil
    i. Deck Drainage

A. <u>HDD Clay-based Drilling Fluids and Drill Cuttings at the Seafloor:</u> The limitations imposed on Outfall 003 - Clay-based Drilling Fluids and Drill Cuttings in the permit rely on effective and reasonable pollution prevention strategies that promote reducing or eliminating potentially toxic chemicals or replacing them with less toxic substitutions. For the HDD discharges, the permit prohibits the discharge of free oil, requires a chemical inventory, and implementation of BMPs to minimize the volume of the HDD as much as practicable. The prohibition of no free oil as determined by visual or Static Sheen Tests are adopted from 40 CFR 435. The prohibition of discharge of free oil for all discharges protects aquatic life as well as public health and welfare. An inventory must be kept for chemicals added to the HDD drilling fluids and made available upon request. Chemical use must be summarized in an End of Construction Report. Implementation of a BMP Plan is required to minimize the discharge of pollutants associated with HDD and construction barge discharges.

B. <u>Domestic Wastewater</u>: As discussed in Appendix B, the limits for Outfall 001A and 001B – Domestic Wastewater are based on minimum treatment per 18 AAC 72.050. As a result of the perceived difficulties for some domestic wastewater systems to meet the state regulatory minimum treatment requirements, the permit clarifies and emphasizes adherence to existing requirements in 18 AAC 72 to help ensure treatment systems are capable of complying with the permit limits. 18 AAC 72.200 requires engineering plan reviews prior to discharge to ensure compliance with the minimum treatment requirements and permit conditions.

C. <u>Discharges Potentially Contaminated with Oil:</u> The permit prohibits the discharge of free oil as determined by the visual sheen test, or Static Sheen Test, and requires treatment of deck drainage using an oil-water separator on the platform and seasonal MODU. As previously stated, the Department considers prohibiting the discharge of free oil to be the most effective and reasonable treatment and pollution control techniques for these discharges. 40 CFR 110.3 defines the quantity of oil that may be harmful to public health or welfare as a discharge that causes a sheen or discoloration on the receiving water. Implementation of a BMP Plan is required to ensure that toxic chemicals do not come in contact with storm water to prevent the discharges of chemicals in toxic amounts.

Each waste stream is either treated using the most effective and reasonable methods or controlled by implementing practicable and effective pollution prevention and control strategies. The Department has concluded the most effective methods of pollution prevention, control, and treatment are the requirements and BMPs in the permit and that this finding is met.

5. 18 AAC 70.015(a)(2)(E). All wastes and other substances discharged will be treated and controlled to achieve (i) for new and existing point sources, the highest statutory and regulatory requirements; and (ii) for nonpoint sources, all cost-effective and reasonable best management practices.

   Applicable "highest statutory and regulatory requirements" are defined in 18 AAC 70.990(30), as amended through June 26, 2003, and *Interim Methods*. Accordingly, there are three parts to the definition, which are:

   - Any federal TBEL identified in 40 CFR 125.3 and 40 CFR 122.29, as amended through August 15, 1997, adopted by reference at 18 AAC 83.010;
   - Minimum treatment standards in 18 AAC 72.040; and
   - Any treatment requirement imposed under another state law that is more stringent than requirement of this chapter.

   The first part of the definition includes all applicable federal technology-based ELGs, in this case, as found in 40 CFR Part 435 Subpart D Coastal Subcategory, adopted by reference at 18 AAC 83.010(g)(3). In the absence of ELGs for specific waste streams, Case-by-case TBELS are established based on a BPJ or through a WQBEL analysis.

   For domestic wastewater, the ELGs for BPT and BCT require TRC to be maintained as close to 1.0 mg/L as possible immediately after disinfection and the ELGs also require no discharge of floating solids. Establishing a case-by-case TBEL limit of 1.0 mg/L as a maximum after a subsequent dechlorination step that additionally ensures TRC is limited in the domestic wastewater discharge. For deck drainage discharges, the ELGs for BAT and BCT require a limitation of no discharge of free oil as determined by the presence of film, sheen, or a discoloration of the surface of the receiving water. The discharge will be inspected for sheen, and if no sheen is observed, the deck drainage water will be discharged into Cook Inlet with no treatment. If an oily sheen is observed, the permittee will collect and treat the impacted water prior to discharge.

   As discussed in Section 5.3.2, the second part of the definition should refer to 18 AAC 72.050 for minimum treatment. In relation to the permit, provisions of this regulation mandate that domestic wastewater being discharged to waters of the U.S. in Alaska water receive secondary treatment as defined at 18 AAC 72.990(59). The Department is implementing case-by-case technology-based requirements for domestic wastewater discharged under the permit referencing state regulation.

   As discussed in Section 5.3.2, the minimum treatment and plan review requirements imposed by 18 AAC 72 are more stringent than WQS requirements. Otherwise, there are no other state laws that the Department is aware of that impose more stringent treatment requirements than 18 AAC 70. The Department has determined that the treatment of the discharge conforms to the highest statutory and regulatory requirements and the finding is met.

7.0 OTHER PERMIT CONDITIONS

7.1 Quality Assurance Project Plan

The permittee is required to develop procedures to ensure that the monitoring data submitted are accurate and to explain data anomalies if they occur. The permittee is required to draft or update the Quality Assurance Project Plan (QAPP) within 120 days of the effective date of the final permit for the discharges resulting from KLU Gas Production Platform A and the seasonal MODU. However, the permittee is not required to develop a QAPP for the discharges resulting from short-term construction activities on barges and the HDD drill site.

The permittee must submit a letter to the Department within 120 days of the effective date of the permit stating that the plan has been implemented within the required time frame. If a QAPP has already been developed and implemented, the permittee need only to review the existing plan to make sure it is up to date and all necessary revisions are made. The QAPP shall consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples; laboratory analysis; and data reporting. The plan shall be retained onsite and made available to the Department upon request.

7.2 Operation and Maintenance Plan

The permit requires the permittee to properly operate and maintain all facilities and systems of treatment and control. Proper operation and maintenance is essential to meeting discharge limitations, monitoring requirements, and all other permit requirements at all times. The permittee is required to develop or update and implement an operation and maintenance plan for its facility within 180 days of the effective date of the final permit. If an Operation and Maintenance Plan has already been developed and implemented, the permittee need only to review the existing plan to make sure it is up to date and all necessary revisions are made. The plan shall be retained on site and made available to the Department upon request.

7.3 Best Management Practices Plan

BMPs are measures that are intended to prevent or minimize the generation and potential for the release of pollutants from industrial facilities to the waters of the U.S. through normal operations and ancillary activities. Pursuant to CWA Section 402(a)(1), development and implementation of BMP Plans may be included as a condition in APDES permits. CWA Section 402(a)(1) authorizes DEC to include miscellaneous requirements that are deemed necessary to carry out the provision of the CWA in permits on a case-by-case basis. BMPs are required to control or abate the discharge of pollutants in accordance with 18 AAC 83.475. There are two types of BMP Plans required by the permit, one for short-term construction activities and one for long-term facility operation at the KLU Gas Production Platform A and seasonal MODU. The BMP Plan for KLU Gas Production Platform A and seasonal MODU must be located onsite. BMP Plans for construction must be located on each barge and the HDD drill site.

The permittee must develop a BMP Plan(s) which achieves the overall objectives and specific requirements to prevent or minimize the generation and release of pollutants

during gas production and extraction activities and construction of the gathering pipeline. The permit contains specific requirements for developing a DFP and submitting it to the Department for approval prior to discharging (See Section 3.3.3.1). The permittee may adopt the DFP as part of the overall BMP Plan for the HDD drill site.

The permittee must amend the BMP Plan whenever there is a change in the facility or in the operation of the facility that materially increases the generation of pollutants or their release or potential release to the receiving waters. The permittee must also amend the BMP Plan, as appropriate, when facility operations covered by the BMP Plan change. All changes to the BMP Plan must be reviewed by the facility engineering staff and manager. Changes to the BMP Plan shall be consistent with the objectives and specific requirement as described in Section 2.2 of the permit. The permit requires the permittee to develop or update and implement a BMP Plan within 180 days of the effective date of the final permit. The Plan must be kept onsite and made available to the Department upon request.

8.0 OTHER LEGAL REQUIREMENTS

8.1 Endangered Species Act

The Endangered Species Act (ESA) requires federal agencies to consult with the National Oceanic and Atmospheric Administration (NOAA) Marine Fisheries and the U.S. Fish and Wildlife Service if their actions could beneficially or adversely affect any threatened or endangered species. As a state agency, DEC is not required to consult with these federal agencies regarding permitting actions; however, the Department voluntarily requested information from the National Marine Fisheries Service (NMFS) regarding threatened or endangered species in the vicinity of the KLU Gas Production Platform A, and a response was received on March 12, 2013. The following endangered species may occur in Cook Inlet in the vicinity of the discharge: Cook Inlet Beluga Whale (Delphinapterus leucas) and Stellar Sea Lion (Eumetopias jubatus).

Several ESA-listed stocks of Pacific salmon may occur within Alaska's waters, although specific information on their occurrence within Cook Inlet is not available. These include the following Evolutionarily Significant Units: Snake River fall Chinook, Snake River spring/summer Chinook, Puget Sound Chinook, Upper Columbia River spring Chinook, Lower Columbia River Chinook, Upper Columbia River steelhead, Upper Willamette River steelhead, Middle Columbia River steelhead, Lower Columbia River steelhead, and Snake River basin steelhead.

8.2 Essential Fish Habitat

Essential fish habitat (EFH) includes waters and substrate (sediments, etc.) necessary for fish from commercially-fished species to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires federal agencies to consult with NOAA when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH. Although DEC as a state agency is not required to consult with these federal agencies regarding permitting actions, the Department voluntarily requested information from the National Marine Fisheries Service (NMFS) regarding essential fish habitat in the vicinity of the KLU Gas

Production Platform A. Based on a response received on March 12, 2013 NMFS indicated EFH is prevalent in Cook Inlet much like most of Alaskan marine waters. The habitats of potential concern are typically the estuarine and near shore habitat of the Pacific salmon and herring spawning grounds. Figure 3 provides a summary of the EFH species within the permit coverage area.

8.3 Permit Expiration

The permit will expire five years from the effective date of the permit.

9.0 REFERENCES

1. Alaska Department of Commerce, Community, and Economic Development. Division of Economic Development. 2009 Alaska Economic Performance Report. February 2011.

2. Alaska Department of Environmental Conservation. Alaska Water Quality Criteria Manual for Toxics and Other Deleterious Organic and Inorganic Substances, as amended through December 12, 2008.

3. Alaska Department of Environmental Conservation. Alaska's Final 2010 Integrated Water Quality Monitoring and Assessment Report.

4. Alaska Department of Environmental Conservation. Interim Antidegradation Implementation Methods. Retrieved from http://www.dec.state.ak.us/water/wqsar/Antidegradation/docs/P&P-Interim_Antidegradation_Implemenation_Methods.pdf

5. Alaska Department of Environmental Conservation. 18 ACC 70. Water Quality Standards, as amended through June 26, 2003.

6. Alaska Department of Environmental Conservation. 18 ACC 70. Water Quality Standards, as amended through July 1, 2008.

7. Alaska Department of Environmental Conservation. 18 ACC 70. Water Quality Standards, as amended through April 8, 2012.

8. Alaska Department of Environmental Conservation. 18 AAC 83. Alaska Pollutant Discharge Elimination System Program. As amended Through October 23, 2008.

9. Alaska Department of Environmental Conservation. 18 ACC 72. Wastewater Disposal, as amended through December 23, 2009.

10. Alaska Department of Environmental Conservation. Interim Antidegradation Implementation Methods. Division of Water. Policy and Procedure No. 05.03.103. July 14, 2010.

11. Development Document for Effluent Limitations Guidelines and Standards for the Offshore Subcategory of the Oil and Gas Extraction Point Source Category (Final). Office of Water, EPA #921-R-93-003. U.S. EPA, Washington DC. January 1993.

12. U.S. EPA, 40 CFR PART 435. Oil and Gas Extraction Point Source Category Offshore Subcategory Effluent Guidelines and New Source Performance Standards Final Rule. 48 Federal Register 1254, March 4, 1993.

13. U.S. EPA, Region 10. Final General NPDES Permit AKG285000 for Cook Inlet Oil and Gas Development and Production Facilities. July 2, 2007.

14. U.S. EPA, Technical Support Document for Water Quality-based Toxics Control. Office of Water, EPA/505/2-90-001, PB91-127415. Washington D.C., March 1991.

APPENDIX A. FIGURES

Figure 1: Kitchen Lights Unit Gas Production Platform A – Map

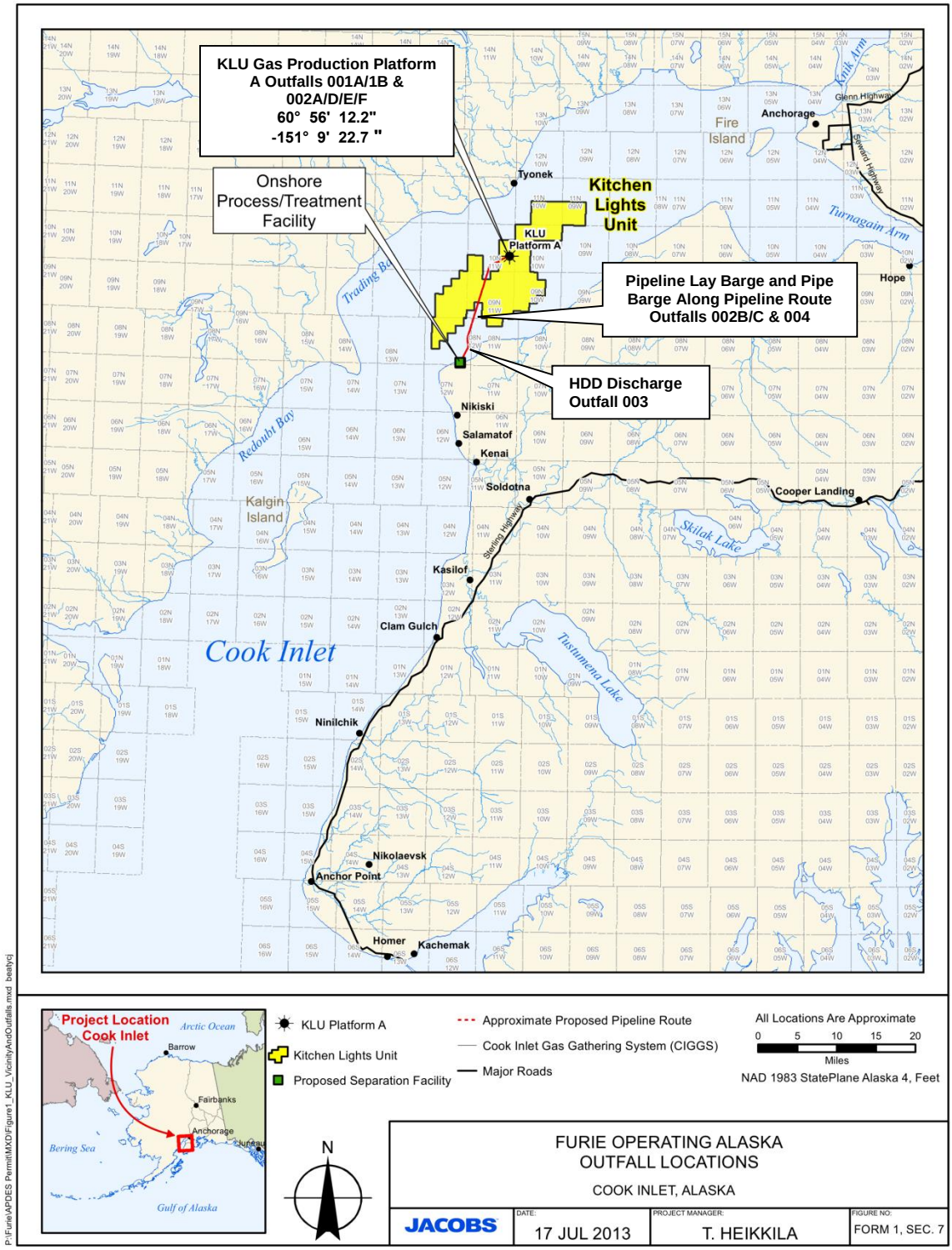


Figure 2: Kitchen Lights Unit Gas Production Platform A - Process Flow Diagram

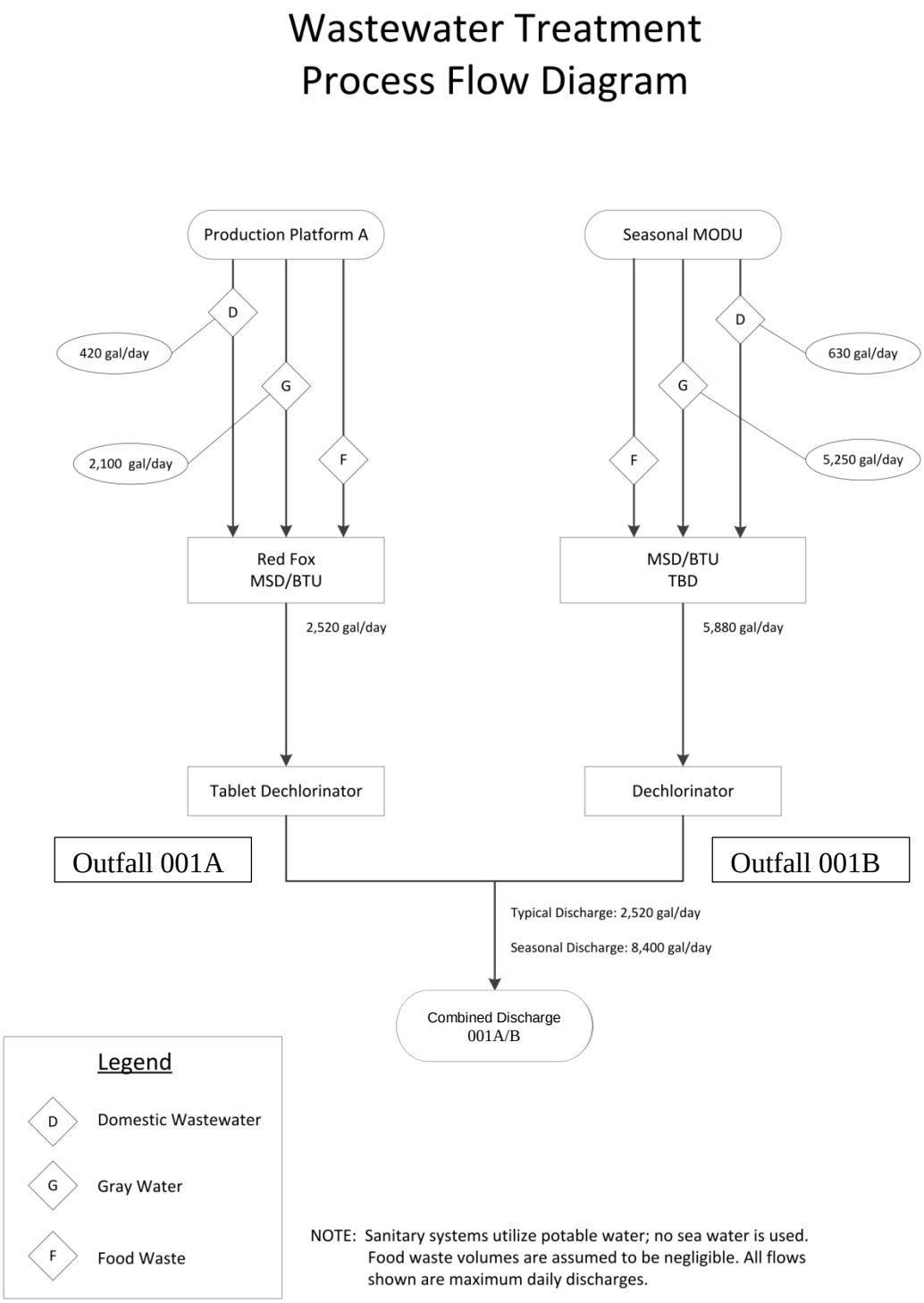
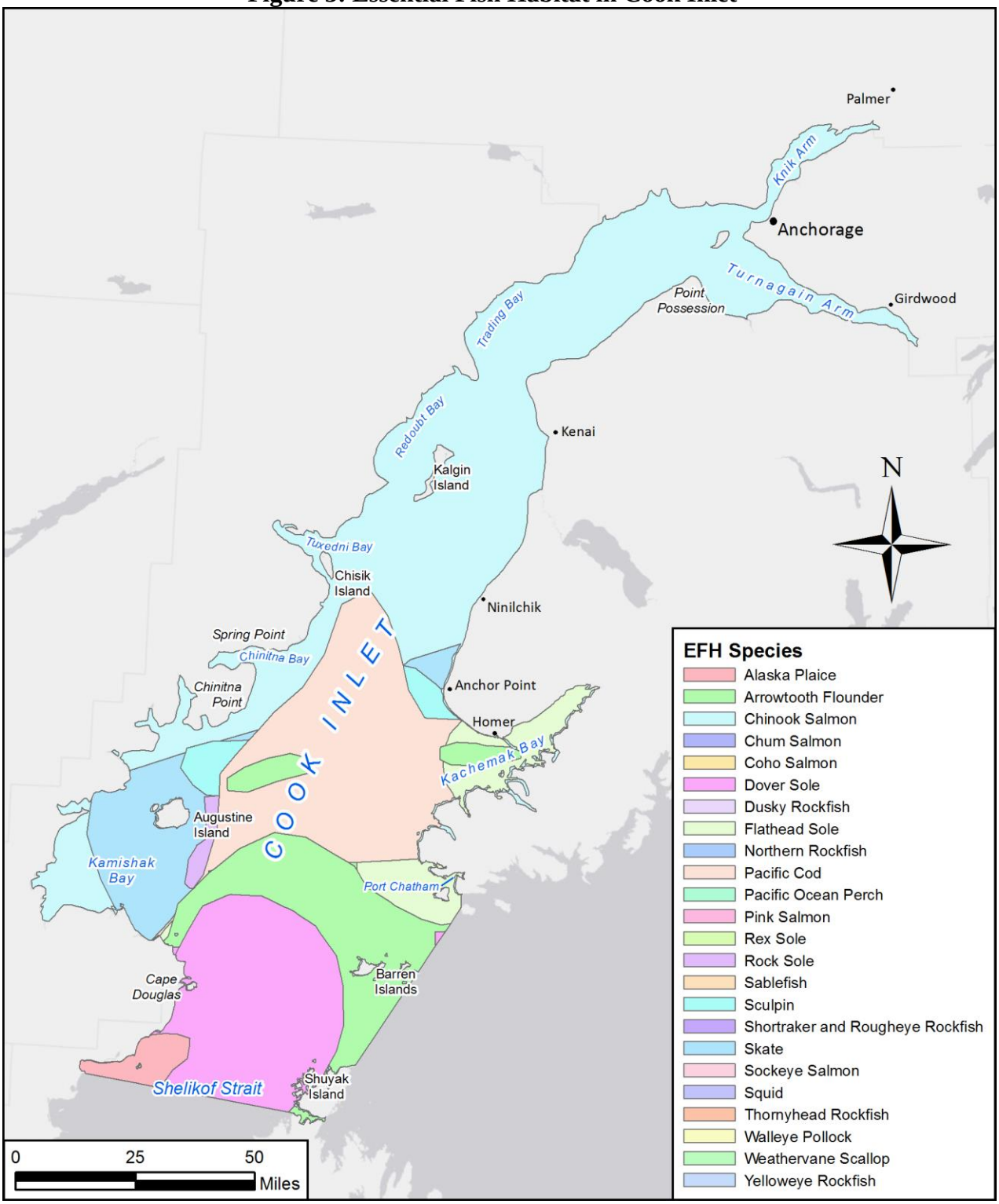


Figure 3: Essential Fish Habitat in Cook Inlet



APPENDIX B. BASIS FOR EFFLUENT LIMITATIONS

The Alaska Department of Environmental Conservation (DEC or Department) prohibits the discharge of pollutants to waters of the U.S. per Title 18, Chapter 83, Section 15 of the Alaska Administrative Code (18 AAC 83.015) unless first obtaining a permit implemented by the Alaska Pollutant Discharge Elimination System (APDES) point source discharge program that meets the purposes of Alaska Statutes 46.03 and is in accordance with the Clean Water Action (CWA) Section 402 and the requirements adopted by 18 AAC 83.010. Per these statutory and regulatory provisions, the permit includes effluent limits that require the discharger to (1) meet standards reflecting levels of technological capability, (2) comply with Water Quality Standards (WQS), (3) and comply with other state requirements that may be more stringent.

The CWA requires oil and gas extraction facilities to meet effluent limitation guidelines (ELG) based on available wastewater treatment technology. These ELGs mandate technology-based effluent limits (TBELs) that are applied at the end of pipe. TBELs are developed using established available treatment technology. Where national ELG's have not been developed, or where they did not consider specific waste streams or pollutants, the same performance-based approach used to develop national ELGs can be applied to a specific industrial facility using BPJ on a case-by-case basis if deemed appropriate by the regulatory agency. The Department may find by analyzing the effect of an effluent discharge on the receiving water body that TBELs result in exceeding water quality criteria at the point of discharge. In these cases, the Department generally develops water quality-based effluent limits (WQBELs), which are designed to ensure that the WQS of the receiving water body are met.

In establishing permit limits, the permit writer first determines which TBELs must be incorporated into the permit. Per Code of Federal Regulations, Title 40, Part 435, Oil and Gas Extraction Point Source Category (40 CFR 435), Subpart D – Coastal Subcategory the KLU Gas Production Platform A is classified as a new source , which means the NSPS found in the Coastal Subcategory apply to the discharges. The permit writer then screens parameters in the discharges that could have concentrations greater than water quality criteria at the end of pipe. Focusing on these parameters, a Reasonable Potential Analysis (RPA) is then conducted to determine if the discharge could result in exceedances of the water quality criteria in the receiving water body beyond the boundary of an authorized mixing zone on a parameter by parameter basis. If exceedances could occur, limits must be included in the permit for that particular parameter. The limits in the permit reflect whichever requirements (technology-based or water quality-based) are more stringent. This evaluation resulted in the permit containing a TBELs per 40 CFR 435, TBELs developed using best professional judgment (BPJ), technology-based requirements based on State minimum treatment standards, and one WQBEL for pH.

As regulated under 40 CFR 435 and other APDES permits, there are generally 19 different discharges associated with oil and gas production facilities that are considered during permit development. However, note that the clay-based drilling fluids and cuttings for the HDD used during construction of the gather pipeline is not included in this discussion. This exclusion is due to the HDD fluids being too dissimilar to those used in oil and gas exploration and development drilling. The reader is referred to Section 2.1 for information on Clay-based Drilling Fluids and Drill Cuttings (Outfall 003). The following discussion provides an overview of each discharge and how it applies to the KLU Gas Production Platform A.

1. **Drilling Muds & Cuttings**

Drilling fluids are the circulating fluids used in the rotary drilling of oil and gas wells to clean and condition the borehole, counterbalance formation pressure and transport drill cuttings to the surface. Drill cuttings are the particles generated by drilling into subsurface geologic formations and carried to the surface with the drilling fluid. On the KLU Gas Production Platform A, production cuttings and drilling fluids will be containerized and transported onshore for proper disposal. Therefore, the applicant did not apply for authorization to discharge this waste stream.

2. Deck Drainage

Deck drainage refers to any waste resulting from platform washing, deck washing, spillage, rainwater, and runoff from curbs, gutters, and drains, including drip pans and wash areas. This could also include pollutants, such as detergents used in platform and equipment washing, oil, grease, and drilling fluids spilled during normal operations. On KLU Gas Production Platform A and seasonal MODU, the discharge will occur after treatment in an oil/water separator. During construction activities for the gathering pipeline and installation of the platform, four construction barges will be covered under this permit for deck drainage. DEC understands that discharges may be stored in a tank prior to discharge so that a visual sheen test can be conducted prior to discharge. In these situations, free oil may be removed by sorbents rather than by oil/water separators prior to discharge. Deck drainage discharges require treatment using an oil/water separator, or other means, and Visual or Static Sheen Testing.

3. Domestic Wastewater

The state regulatory definition of domestic wastewater in 18 AAC 72.990(23) includes graywater and black water whereas federal regulations in 40 CRF 435 indicate black water is sanitary wastewater and graywater is domestic wastewater. Federal regulation 40 CFR 435 requires different pollution control measures for domestic and sanitary wastewater. However, because graywater is considered a component of domestic wastewater under state regulation, graywater by itself is subject to the same regulatory requirements as domestic wastewater that contains black water only, or commingled black and graywater. Per 18 AAC 72.050, domestic wastewater must receive minimum treatment prior to being discharged to waters of the U.S. in Alaska unless a waiver is granted by the Department per 18 AAC 72.060. Minimum treatment is defined as secondary treatment per 18 AAC 72.990(59) and is similar to federal effluent limit guidelines (ELGs) for publically owned treatment works (POTWs).

The domestic wastewater system on the KLU Gas Production Platform A is proposed to be a Red Fox (or equivalent) marine sanitation device (MSD) with a secondary biological treatment unit (BTU) and tablet dechlorination. The Red Fox (or equivalent) MSD/BTU is expected to meet the minimum treatment requirements per 18 AAC 72.050. Reference to MSD/BTU hereafter refers to any system that has equivalent treatment performance as the proposed Red Fox MSD/BTU. Operation of a seasonal mobile offshore drilling unit (MODU) will generate additional domestic wastewater that will be treated to achieve a comparable level of performance as the KLU Gas Production Platform A treatment system. Discharge from the seasonal MODU (Outfall 001B) will be combined with the

discharge from KLU Gas Production Platform A (Outfall 001A) and discharged through a common submerged port.

4. Graywater

The definition of graywater in 18 AAC 72.990(35) is consistent with the definition for domestic wastewater established in 40 CFR 435.11(j) and 40 CFR 435.41(l) as adopted by reference at 18 AAC 83.010(g)(3). Graywater is defined as: "the materials discharged from sinks, showers, laundries, safety showers, eye-wash stations, hand-wash stations, fish cleaning stations, and galleys located within facilities subject to this Subpart." However, graywater is considered a component of domestic wastewater per 18 AAC 72.050 and requires minimum treatment (i.e., secondary treatment as defined in 18 AAC 72.990(59)) unless a waiver is granted by the Department under 18 AAC 72.060.

Because KLU Gas Production Platform A and the seasonal MODU will commingle graywater with blackwater and treat this domestic wastewater to greater than minimum treatment requirements, a graywater discharge is not applicable.

5. Desalination Unit Waste

Desalination unit waste is wastewater associated with the process of creating potable water from seawater. The applicant did not apply for authorization to discharge this waste stream.

6. Blowout Preventer Fluid

Blowout preventer fluid used to actuate hydraulic equipment on the blowout preventer. The applicant did not apply for authorization to discharge this waste stream.

7. Boiler Blowdown

Boiler blowdown is the discharge of water and minerals drained from boiler drums to minimize solids build-up in the boiler. Any boiler blowdown wastewater will be transported via pipeline to the onshore production facility for separation and appropriate disposal. Therefore, the applicant did not apply for authorization to discharge this waste stream.

8. Fire Control System Test Water

Fire control system test water is sea water that is released during the training of personnel in fire protection, and the testing and maintenance of fire protection equipment on the lay barge. Testing of the fire control system on the pipeline lay barge will be conducted periodically. The system utilizes seawater pumped directly from Cook Inlet and has not been treated or chemically altered. Minimal test water is generated during each test at approximately 150 gallons per event. No other barge or facility operating under the permit is authorized to discharge fire control system test water.

9. Non-contact Cooling Water

Non-contact cooling water is sea water that is used for non-contact, once-through cooling of various pieces of machinery on the platform. The applicant did not apply for authorization to discharge this waste stream.

10. Uncontaminated Ballast Water

Ballast water is seawater added or removed to maintain the proper ballast floater level and ship draft. The applicant did not apply for authorization to discharge this waste stream.

11. Bilge Water

Bilge water collects in the lower internal parts of the drilling vessel hull. Bilge water will be transported via pipeline to the onshore production facility for separation and appropriate disposal. The applicant did not apply for authorization to discharge this waste stream.

12. Excess Cement Slurry

Excess cement slurry will result from equipment washdown after cementing operations. Any excess cement slurry will be containerized and transported onshore for proper disposal. Therefore, the applicant did not apply to discharge this waste stream.

13. Mud, Cuttings, Cement at Seafloor

Muds, cuttings, and cement at the seafloor are materials discharge at the surface of the ocean floor in the early phases of drilling operations, before the well casing is set, and during well abandonment and plugging. The applicant did not apply for authorization to discharge this waste stream. However, the applicant did apply for a similar discharge consisting of clay-based drilling fluids to the seafloor associated with horizontal drilling activities supporting construction of a gather pipeline from KLU Gas Production Platform A to an onshore processing facility. See section 2.1 for more information.

14. Waterflooding Discharges

Waterflooding is the injection of treated seawater into hydrocarbon-bearing formation to improve the flow of hydrocarbons from production wells. This treated seawater may also be used for toilet and urinal flush water. Waterflooding wastewater is backwash and reject water generated during treatment of the seawater and will be transported via pipeline to the onshore production facility for separation and appropriate disposal. Therefore, the applicant did not apply for authorization to discharge this waste stream.

15. Produced Water and Solids

Produced water refers to the water (brine) brought up from the hydrocarbon-bearing strata during the extraction of oil and gas, and can include formation water, injection water, and any chemicals added downhole or during the oil/water separation process. Produced solids are sands and other solids deposited from produced water which collect in vessels and lines and which must be removed to maintain adequate vessel and line capacities. The produced water and solids will be transported via pipeline to the onshore production facility for separation and appropriate disposal. Therefore, the applicant did not apply for authorization to discharge this waste stream.

16. Well Completion Fluids

Well completion fluids are salt solutions, weighted brines, polymers, and various additives used to prevent damage to the well bore during operations which prepare the drilled well for hydrocarbon production. The well completion fluids will be transported via pipeline to the onshore production facility for separation and appropriate disposal. Therefore, the applicant did not apply for authorization to discharge this waste stream.

17. Workover Fluids

Workover fluids are salt solutions, weighted brines, polymers, or other specialty additives used in a producing well to allow safe repair and maintenance or abandonment procedures. The workover fluids will be transported via pipeline to the onshore production facility for separation and appropriate disposal. Therefore, the applicant did not apply for authorization to discharge this waste stream.

18. Well Treatment Fluids

Well treatment fluid refers to any fluid used to restore or improve productivity by chemically or physically altering hydrocarbon-bearing strata after a well has been drilled. The well treatment fluids will be transported via pipeline to the onshore production facility for separation and appropriate disposal. Therefore, the applicant did not apply for authorization to discharge this waste stream.

19. Test Fluids

Test fluids are discharges that occur if hydrocarbons located during exploratory drilling are tested for formation pressure and content. This would consist of fluids sent downhole during testing, along with water from the formation. The test fluids will be transported via pipeline to the onshore production facility for separation and appropriate disposal. Therefore, the applicant did not apply for authorization to discharge this waste stream.

The applicant has only applied to discharge the following waste streams:

- KLU Gas Production Platform A Domestic Wastewater (Outfall 001A)
- Seasonal MODU Domestic Wastewater (Outfall 001B)
- Deck Drainage (Outfalls 002A-002F),
- HDD (Outfall 003), and
- Fire Control System Test Water (Outfall 004).

Therefore, the permit only includes effluent limitations, requirements, and conditions for those waste streams. The permit does not authorize the discharge of waste streams that were not clearly identified in the permit application process, and the permit requires reporting of any discharges that are not authorized by the permit.

B.1 Technology Based Effluent Limits Using Effluent Limitation Guidelines

National ELGs are developed by the Environmental Protection Agency (EPA) based on the demonstrated performance of a reasonable level of treatment that is within the economic means of specific categories of industrial facilities. For conventional pollutants (see 40 CFR 401.16). CWA Section 301(b)(1)(E) requires the imposition of effluent limits based on Best Conventional Pollutant Control Technology (BCT). For nonconventional and toxic pollutants, CWA Section 301(b)(2)(A), (C), and (D) require the imposition of effluent limits based on Best Available Technology Economically Available (BAT). CWA Section 301(b) requires compliance with BCT and BAT no later than March 31, 1989. Best Practicable Control Technology Currently Available (BPT) was the first level of control applicable to all pollutants. The compliance deadline for BPT was July 1, 1977.

EPA has promulgated national ELGs for the Oil and Gas Extraction Point Source Category at 40 CFR 435 D (Coastal Subcategory). DEC adopted the ELGs by reference at 18 AAC 83.010(g)(3). These subparts specify BCT, BAT, BPT, and NSPS for the Coastal Subcategory of the Oil and Gas Point Source Category. The following sections discuss the TBELs derived from these ELGs used in the permit

B.1.1 Free Oil

The ELGs for BAT and BCT require a limitation of no discharge of free oil as determined by the presences of a sheen, film, or discoloration on the surface of the receiving water.

B.1.2 Total Residual Chlorine

The effluent limitations contained in the permit and shown in Table B-1 below implement the requirements found in 40 CFR Part 435 for TRC as a surrogate parameter for bacteria. For domestic wastewater discharges, the Offshore and Coastal Subcategory ELGs for NSPS and BPT require TRC to be 1.0 mg/L and maintained as close to this concentration as possible for facilities that are continuously manned by ten or more persons (M10). KLU Gas Production Platform A and the seasonal MODU will be manned by ten or more persons and will use chlorine to disinfect wastewater before the discharge of domestic wastewater through Outfall 001A and Outfall 001B. The point of compliance is at the point of chlorination and before dechlorination. See Section B.3 for TBELs based on BPJ for TRC downstream of dechlorination.

Table B.1: Technology-Based Effluent Chlorine Limits - Outfalls 001A/B

Parameter	Daily Minimum	Daily Maximum	Units	Sample Location	Sample Frequency	Sample Type
TRC	1.0 [c]	---	mg/L	Effluent [b]	1/Month	Grab

a. The 1.0 mg/L daily maximum limit is measured after dechlorination and before combining with other discharges.
b. Compliance point.
c. TRC is a surrogate parameter for fecal coliform and enterococci bacteria. For KLU Gas Production Platform A and the Seasonal MODU, maintain as close to the minimum limit concentration of 1.0 mg/L as possible and measure immediately after chlorination.

B.2 Technology Based Effluent Limits Using BPJ

There are no ELGs for privately owned secondary treatment facilities. Therefore, the Department is applying regulatory and technology-based minimum treatment requirements

(18 AAC 72.050) for BOD_5 and TSS defined as secondary treatment per 18 AAC 72.990(59). However, the average weekly limit in the definition is not adopted in the permit because monthly average and maximum daily limits are sufficient to control these pollutants in the discharge.

The applicable ELGs use TRC as a surrogate for bacteria destruction and require a minimum concentration of 1.0 mg/L to be maintained as close as possible to this concentration at the point of chlorination. Data from existing production facilities using these systems suggests maintaining TRC as close to 1.0 mg/L as possible is difficult. Therefore, DEC is developing a TBEL based on BPJ of 1.0 mg/L maximum based on the understanding that dechlorination systems are readily available, economically achievable, and are effective in reducing chlorine concentrations prior to discharge. This TBEL is based on BCT, BPT, and NSPS. Because dechlorination is required, the difficulty observed in maintaining levels of TRC for bacteria destruction as close as possible to 1.0 mg/L is not of significant concern. Applied in this manner, the TRC limit of 1.0 mg/L maximum is consistent with the objective of bacteria destruction in the ELG. The ELG compliance is at the point of chlorination whereas the compliance point for the TBEL based on BPJ is after dechlorination, the last treatment in the system, and before becoming comingled.

The technology-based secondary treatment effluent limits developed through BPJ for Outfall 001A and Outfall 001B are listed in Table B-2.

Table B.2- 1: Domestic Wastewater Treatment Effluent Limits - Outfalls 001A/B

	Effluent Limits				Monitoring Requirements		
Parameter	**Daily Minimum**	**Monthly Average**	**Daily Maximum**	**Units**	**Sample Location**	**Sample Frequency**	**Sample Type**
BOD_5	N/A	30	60	mg/L	Effluent	1/Month [a,b]	Grab or Composite [c]
TSS	N/A	30	60	mg/L	Effluent	1/Month [a,b]	Grab or Composite [c]
TRC	---	N/A	1.0 [d]	mg/L	Effluent	1/Month	Grab
pH	6.5	N/A	9.0	SU	Effluent	1/Month	Grab
Floating Solids	No Discharge			---	Receiving Water	1/Day [e]	Observation [f]
Foam	No Discharge			---	Receiving Water	1/Day [e]	Observation [g]
Garbage	No Discharge			---	t Receiving Water	1/Day [e]	Observation [g]
Oily Sheen	No Discharge			---	Receiving Water	1/Day [e]	Observation [g]

	Effluent Limits				Monitoring Requirements		
Parameter	Daily Minimum	Monthly Average	Daily Maximum	Units	Sample Location	Sample Frequency	Sample Type

Notes:

a. Effluent sampling frequency for BOD_5 and TSS is increased to weekly when the Seasonal MODU is connected to the KLU Gas Production Platform A.

b. Influent samples must be taken over approximately the same time period as effluent samples. Influent monitoring for BOD_5 and TSS is required for the first three years of the permit, after which the permittee may submit a request to the Department for written determination that this requirement be suspended.

c. Composite samples must consist of at least eight grab samples proportional to flow collected at approximately equally spaced intervals.

d. The 1.0 mg/L daily maximum limit is measured after dechlorination and before combining with other discharges.

e. Only when discharges occur.

f. The permittee must monitor by observing the surface of the receiving water in the vicinity of the outfall(s) during daylight at the time of maximum estimated discharge and during conditions when observation on the surface of the receiving water is possible in the vicinity of the discharge. Observations must follow either the morning or midday meal. Observations must be recorded in daily operating logs and made available upon request by DEC.

g. The permittee must monitor by observing the surface of the receiving water in the vicinity of the outfall(s) during daylight at a minimum frequency of once per day. Monitoring of the effluent for foam, garbage, and oily sheen is to determine compliance with narrative effluent limits. Observations must be recorded in daily operating logs and made available upon request by DEC.

The technology-based secondary treatment effluent limits developed through BPJ for Outfall 002 are listed in Table B.2-2.

Table B.2- 2: Technology-Based Discharge Effluent Limits for Deck Drainage - Outfall 002

Parameter	Daily Minimum	Monthly Average	Daily Maximum	Units	Sample Location	Sample Frequency	Sample Type
Free Oil [a]	No Discharge			---	Effluent	Daily	Visual

Notes:

a. As determined by the presence of a film, sheen, or a discoloration upon the receiving water (visual sheen). If discharge occurs during broken or unstable ice conditions or during stable ice conditions, the Static Sheen Test must be used (see 40 CFR Part 435 Subpart A, Appendix 1) and a grab sample is required.

The HDD from the bluff to the seafloor will occur in two phases, drilling a pilot borehole and subsequent reaming of the pilot borehole to a larger diameter. The drilling fluids proposed for use during the HDD for pipeline construction is predominately clay-based with fractions of silica minerals. Chemical additives to maintain beneficial fluid properties may be needed as well. The permit requires development of a drilling fluids plan (DFP) that describes what chemicals are anticipated to be required, approximate concentrations, and how these chemicals have been selected to minimize toxicity in the discharge. The DFP must be approved by the Department prior to discharging clay-based drilling fluids and cuttings. In addition, the no discharge of free oil from CFR 435, Subpart D is adopted by BPJ referencing BAT, BPT, BCT, and NSPS. A Static Sheen Test will be required a maximum of six hours prior to the discharge of fluids from the pilot borehole. While reaming the pilot borehole, a Visual Sheen Test will be required on the surface of the receiving water during times when an observation is possible. Table B.2-3 provides a summary of case-by-case TBEL limits for Outfall 003 developed based on BPJ.

Table B.2- 3: Horizontal Drilling Discharge Effluent Limits - Outfall 003

	Effluent Limits		Monitoring Requirements		
Parameter	**Limits**	**Units**	**Sample Location**	**Sample Frequency**	**Sample Type**
Free Oil (Pilot Borehole) a	No Discharge	---	Effluent	Prior to Discharge	Grab
Free Oil (Ream Borehole) b	No Discharge	---	Effluent	While Discharging	Visual

Notes:

a. The permittee shall collect a sample at the mud pit and conduct a Static Sheen Test within six hours prior to discharging the contents of the pilot borehole. Report the date and time of the sample and the one-time discharge, the total estimated discharge and Static Sheen Test results in the End of Construction Report (See Section 3.4).

b. The permittee must monitor by observing the surface of the receiving water in the vicinity of the discharge during daylight hours during low and high slack tides. Observations must be made at least daily and be recorded in daily operating log. Visual sheen tests must be recorded on monthly DMRs and submitted in the End of Construction Report (See Section 3.4).

The technology-based secondary treatment effluent limits developed through BPJ for Outfall 002 are listed in Table B.2-4.

Table B.2- 4: Fire Control System Test Water Effluent Limits - Outfall 004

Parameter	Limits	Units	Sample [a] Location	Sample [b] Frequency	Sample Type
Free Oil [a]	No Discharge	---	Effluent	End of Well	Grab

Notes:

a. As determined by the presence of a film, sheen, or a discoloration upon the receiving water (visual sheen).

B.3 Water Quality – Based Effluent Limits

B.3.1 Statutory and Regulatory Basis

18 AAC 70.010 prohibits conduct that causes or contributes to a violation of the WQS. 18 AAC 83.435 requires that APDES permits include conditions to meet any applicable requirement in addition to or more stringent than promulgated ELGs. The regulations require the permitting authority to conduct a reasonable potential analysis using procedures that account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving water body. The limits must be stringent enough to ensure that WQS are met and must be consistent with any available wasteload allocation (WLA).

B.3.2 Reasonable Potential Analysis and WQBELs

When evaluating the effluent to determine if WQBELs derived from water quality criteria are needed, the Department screens for pollutants of concern and projects the receiving water body concentration for each pollutant of concern at the edge of the mixing zone. Factors considered in the RPA included availability of existing performance data, the maximum expected concentration of the parameter in effluent if possible, water quality criterion, the dilution authorized in a mixing zone, and concentration of the parameter, if present, in the receiving water. Because this is a new facility, there is no data available to determine reasonable potential. Accordingly, a parameter by parameter RPA based on

numeric criteria cannot be performed at this time. However, the Department has considered technological aspects of the discharges to evaluate parameters that could present a reasonable potential. Accordingly, regulatory mixing zones have been authorized for TRC at Outfalls 001A and 001B and for turbidity at Outfall 003 to ensure WQS are met at the boundary of the mixing zone.

B.3.2.1 *pH*

The criteria for water supply, aquaculture, water contact recreation, and growth and propagation of fish, shellfish, other aquatic life, and wildlife are the most stringent standards for pH. These standards state that marine waters, "May not be less than 6.5 or greater than 8.5."

The narrative water quality criteria for pH is more stringent than the case-by-case TBEL established using BPJ for privately owned treatment works treating to secondary levels.

B.4 Selection of Most Stringent Limits

B.4.1 BOD_5 and TSS

The permit proposes state minimum treatment requirements (18 AAC 72.050) for BOD_5 and TSS for domestic wastewater and graywater discharges through Outfall 001A and Outfall 001B.

B.4.2 pH

The permit proposes the more stringent WQBELs for pH, 6.5 to 8.5, which shall apply at the compliance points prior to commingling or discharging domestic wastewater through Outfall 001A and Outfall 001B.

B.4.3 Total Residual Chlorine

Dechlorination must be used to remove TRC in the final effluent. The permit proposes a minimum and maximum effluent limit of 1.0 mg/L TRC consistent with the ELGs and case-by-case TBEL. The compliance point for the minimum concentration will be just after chlorination and the compliance point for the maximum concentration will be after the last treatment unit prior to discharge or commingling.

B.4.4 No Discharge of Free Oil

There will be a prohibition of free oil in any discharge, including the one-time HDD. Observation of film, sheen, or discoloration on the water surface may be used for domestic wastewater discharges through Outfalls 001A/1B, 002A through 002E, 003 while reaming the pilot borehole, and 004. The Static Sheen Test must be used for the HDD Outfall 003 when drilling the pilot borehole and for 002A when discharging to ice.

APPENDIX C. MIXING ZONE ANALYSIS CHECKLIST

Mixing Zone Authorization Checklist

based on Alaska Water Quality Standards (2001B)

The purpose of the Mixing Zone Checklist is to guide the permit writer through the mixing zone regulatory requirements to determine if all the mixing zone criteria at 18 AAC 70.240 through 18 AAC 70.270 are satisfied, as well as provide justification to authorize a mixing zone in an APDES permit. In order to authorize a mixing zone, all criteria must be met. The permit writer must document all conclusions in the permit Fact Sheet; however, if the permit writer determines that one criterion cannot be met, then a mixing zone is prohibited, and the permit writer need not include in the Fact Sheet the conclusions for when other criteria were met.

Criteria	Description	Answer & Resources	Regulation
Size	Is the mixing zone as small as practicable? - Permit writer conducts analysis and documents analysis in Fact Sheet at: ►Section 5.3 Mixing Zone Analysis -.	- Yes, mixing zone as small as practicable. • Technical Support Document for Water Quality-Based Toxics Control • Fact Sheet, Section 4.3 • Fact Sheet, Appendix C • DEC's RPA Guidance • EPA Permit Writers' Manual	18 AAC 70.240 (a)(2) 18 AAC 70.245 (b)(1) - (b)(7) 18 AAC 70.255(e) (3) 18 AAC 70.255 (d)

Criteria	Description	Answer & Resources	Regulation
Technology	Were the most effective technological and economical methods used to disperse, treat, remove, and reduce pollutants? **If yes**, describe methods used in Fact Sheet at Section 5.3 Mixing Zone Analysis.	Answer: Yes Fact Sheet, Section 4.3.2	18 AAC 70.240 (a)(3)
Low Flow Design	**For river, streams, and other flowing fresh waters.** - Determine low flow calculations or documentation for the applicable parameters. Justify in Fact Sheet	N/A	18 AAC 70.255(f)
Existing use	Does the mixing zone…		
	(1) Partially or completely eliminate an existing use of the water body outside the mixing zone? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 4.3	18 AAC 70.245(a)(1)
	(2) Impair overall biological integrity of the water body? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 4.3	18 AAC 70.245(a)(2)
	(3) Provide for adequate flushing of the water body to ensure full protection of uses of the water body outside the proposed mixing zone? **If no, then mixing zone prohibited.**	Answer: Yes Fact Sheet Section 4.3.1	18 AAC 70.250(a)(3)

Criteria	Description	Answer & Resources	Regulation
	(4) Cause an environmental effect or damage to the ecosystem that the department considers to be so adverse that a mixing zone is not appropriate? **If yes, then mixing zone prohibited.**	Answer: No Fact Sheet Section 4.3	18 AAC 70.250(a)(4)
Human consumption	Does the mixing zone…		
	(1) Produce objectionable color, taste, or odor in aquatic resources harvested for human consumption? **If yes, mixing zone may be reduced in size or prohibited.**	Answer: No Fact Sheet Section 4.3.4	18 AAC 70.250(b)(2)
	(2) Preclude or limit established processing activities of commercial, sport, personal use, or subsistence shellfish harvesting? **If yes, mixing zone may be reduced in size or prohibited.**	Answer: No Fact Sheet Section 4.3.4	18 AAC 70.250(b)(3)
Spawning Areas	Does the mixing zone…		
	(1) discharge in a spawning area for anadromous fish or Arctic grayling, northern pike, rainbow trout, lake trout, brook trout, cutthroat trout, whitefish, sheefish, Arctic char (Dolly Varden), burbot, and landlocked coho, king, and sockeye salmon? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 4.3.5	18 AAC 70.255 (h)

Criteria	Description	Answer & Resources	Regulation
Human Health	Does the mixing zone…		
	(1) Contain bioaccumulating, bioconcentrating, or persistent chemical above natural or significantly adverse levels? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 4.3.6	18 AAC 70.250 (a)(1)
	(2) Contain chemicals expected to cause carcinogenic, mutagenic, tetragenic, or otherwise harmful effects to human health? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 4.3.6	
	(3) Create a public health hazard through encroachment on water supply or through contact recreation? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 4.3.6	18 AAC 70.250(a)(1)(C)
	(4) Meet human health and aquatic life quality criteria at the boundary of the mixing zone? **If no, mixing zone prohibited.**	Answer: Yes Fact Sheet Section 4.3	18 AAC 70.255 (b),(c)
	(5) Occur in a location where the department determines that a public health hazard reasonably could be expected? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 4.3.6	18 AAC 70.255(e)(3)(B)
Aquatic Life	Does the mixing zone…		

Criteria	Description	Answer & Resources	Regulation
	(1) Create a significant adverse effect to anadromous, resident, or shellfish spawning or rearing? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 4.3.7	18 AAC 70.250(a)(2)(A-C)
	(2) Form a barrier to migratory species? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 4.3.7	
	(3) Fail to provide a zone of passage? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 4.3.7	
	(4) Result in undesirable or nuisance aquatic life? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 4.3.7	18 AAC 70.250(b)(1)
	(5) Result in permanent or irreparable displacement of indigenous organisms? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 4.3.7	18 AAC 70.255(g)(1)
	(6) Result in a reduction in fish or shellfish population levels? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 4.3.7	18 AAC 70.255(g)(2)
	(7) Prevent lethality to passing organisms by reducing the size of the acute zone? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 4.3 and Fact Sheet Section 4.3.7	18 AAC 70.255(b)(1)

Criteria	Description	Answer & Resources	Regulation
	(8) cause a toxic effect in the water column, sediments, or biota outside the boundaries of the mixing zone? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 4.3.7	18 AAC 70.255(b)(2)
Endangered Species	Are there threatened or endangered species (T/E spp) at the location of the mixing zone?If yes, are there likely to be adverse effects to T/E spp based on comments received from USFWS or NOAA. If yes, will conservation measures be included in the permit to avoid adverse effects? **If yes, explain conservation measures in Fact Sheet. If no, mixing zone prohibited.**	Answer: Yes Fact Sheet Section 8.1	Program Description, 6.4.1 #5 18 AAC 70.250(a)(2)(D)